The Magazine of the Registered Professional Engineer

American Engineer

DECEMBER 1960

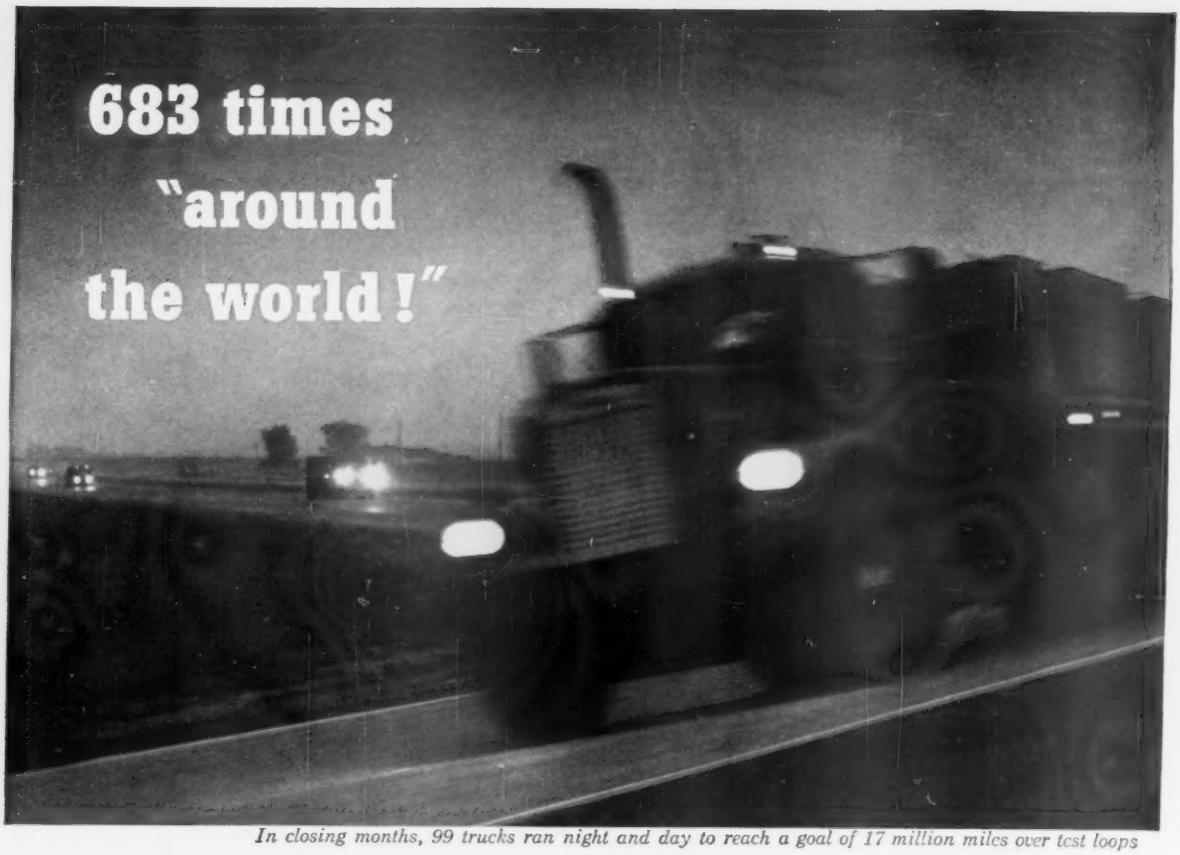
Engineering Goes to Work for SEATO

(See Page 19)

Also:

- *Professional Development*
- *Government Engineering Staffs*
- *Going into Business at the Age of 50*

Season's Greetings



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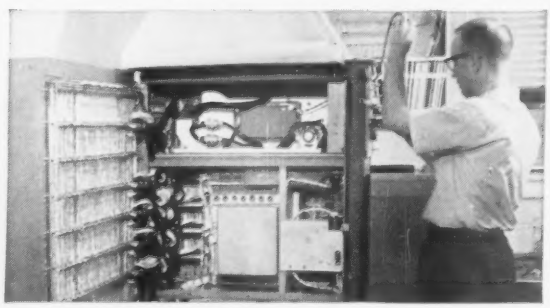

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American Engineer

DECEMBER 1960
Vol. 30, No. 12

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS FOUNDED 1934

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Letters to the Editor

Boost . . .

Dear Editor:

"I BELIEVE" that John West's splendid article in the October issue should be reprinted and made available for all college senior engineers and even we older ones who may have become a bit discouraged.

Wm. W. Reeder, P.E.
Upper Darby, Pa.

Clarification . . .

Dear Editor:

The story in the October issue on white collar unionization (page 15) conveys, I believe, the distinct impression that I am aiding the International Union of Electrical Workers (IUE) in their drive to organize white collar and professional employees. This is not the truth, as I will attempt to explain briefly in the following few paragraphs.

I am a member of the Sperry Gyroscope Company Engineers' Association (EA), an association of engineering employees. The EA has been engaged in giving after hours courses in conjunction with the Nassau County Vocational and Extension Board. I have been teaching the Professional Engineers' Examination Review Course in this program for about three years.

The books referred to in your article were originally class notes. In 1958, these notes were compiled into a soft-cover textbook. In February 1960, President Hall of EA approached me concerning the possibility of a revision into a hard cover, printed format. He mentioned that IUE might provide funds to publish this revision. I told him that I was not particularly interested in IUE support but that since EA was the publisher, it was EA's function to obtain the necessary funds. I also told him that I expected a contract to cover this work on a fee basis in accordance with the customary professional engineering practice.

During March, 1960, EA, in their newspaper, stated that IUE's Engineering Council was sponsoring the publication of these books. I objected to this publicity because of my personal feelings in this matter. Indeed, a contract was subsequently tendered to me and was returned unsigned because it contained the objectionable feature that the books were to contain a foreword written by IUE. In addition, the fee mentioned was lower than that agreed upon in our verbal discussions.

As of this writing, I have received a complete, written release from any further negotiations concerning these books. Neither EA nor IUE will publish them. Any claims to the contrary by either of these organizations are entirely erroneous.

Allan D. Kraus, P.E.
Glen Cove, N.Y.

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Lenz and Hull . . .

Dear Editor:

We enjoyed reading the "Letter to the Editor" by Mr. Sanford V. Lenz, P.E., Chairman, Engineering Council, District 4, IUE-AFL-CIO, Newark, N.J., and the reply by NSPE President Noah E. Hull, P.E. (AE, October, 1960, page 6). We were especially interested in Mr. Lenz' contention "a basic hallmark of a true profession is the condition that working standards, professional conduct, and adequate compensation are set by members of the same profession. Employed engineers in industry are forever being told how to engineer by bright young men with degrees in business administration or economics. A professional must have a forceful organization to establish and enforce professional working conditions and adequate compensation. Will NSPE assume that role?"

In his lengthy reply, President Hull thinks not. Mr. Lenz writes in the language of the union man. President Hull employs the patience and tactics of the professional. One can become so deeply concerned about matters of self-centered importance that the trees become so thick one cannot see the woods. It is easy to understand the reasons for Mr. Lenz being disturbed. The evolution of engineering practice to professional levels is moving at such a rate that one might term it a revolution.

Considerable of the success being obtained is because of the almost unanimous effort being made by teachers of engineering to indoctrinate their students with a professional attitude and philosophy. Most of this effort has been done at the seminar non-credit level. A few instructors have given considerable thought and attention towards raising the level of this clinical teaching from that of the seminar level to a credit course that requires study and associated reading on professional engineering practice. The objective is to secure the effective teaching that automatically results from credit-level effort.

We are processing a curricula-research project which we call the North Dakota State Plan for teaching engineering practice. In this Plan we are successfully exploiting the humanities required by the ECPD which are intended to broaden the thinking and service motivations of the engineer.

(Continued on page 6)

"This Month"

With Uncle Sam presently waging a battle to save the dollar, our aid to underdeveloped nations may, in the near future, of necessity be in terms of knowledge rather than cold cash. Timely, then, is the lead article "This Month"-page 19-which is a staff report on SEATO's new graduate school of engineering.

Does going to church, or being a member of Rotary, or education, or, for that matter, registration, make an engineer a professional? You may think there are no new ideas on engineering professionalism but then you still have not read "Professional Development of Engineers", page 33, by a leading industrialist.

Consulting engineers have expressed concern over the growth of government engineering staffs at all levels. In this issue we present the viewpoint of officials at the Federal level. "Why Government Agencies Need Their Own Engineering Staffs," is written by Commissioner Floyd E. Dominy of the U. S. Bureau of Reclamation. Page 30.

Still toy with the thought of your own consulting office even though the gray hairs are mounting? Don't give up, read about a man who made the great break and at age fifty! Page 25.

Because of reader interest in the general subject, we begin a new feature "This Month" under the heading of "The Engineer and the Law." It is on page 28.

In the back of the book: An Engineers' Week story on page 39, and the 1961-62 nominees for NSPE officerships on pages 42 and 43. The AE Index for 1960 begins on page 47.

The news pages:

General. Page 8. The headlines: Competition for Engineers and Scientists Increases . . . Redstone Rocket Might Have Won Space Race . . . Conference Calls for 'Balance in Industry' . . . NSF Offers Graduate Fellowships to Engineers.

Industry. Page 10. Stories here on these vital subjects: Unions keep trying to organize engineers but admit they have their work cut out for them . . . Congressional report shows engineering recruiting costs on increase . . . Survey shows that few "salaried professionals" are paid for overtime work . . . Detroit U. says engineering grads in 1965 will start at $665 per month . . . Bell Telephone official says Russia doesn't let engineers waste away in the Armed Forces.

Consulting. Page 12. In the news: More reports on regional meetings for consultants . . . Consulting firm awarded contract to plan Alaskan city . . . Canadian fee schedule released . . . Builders say modular measure principle may save $1-Billion yearly.

Education. Page 14. Stories include Stevens' new course for engineers which deals with writing plus, and Armour's work on a new "moon drill".

Registration. Page 17. A highly important story wherein the Maryland Court of Appeals has reversed a lower court order and reinstated the Registration Board's right to deny a license to an applicant unless a written exam is passed.

Merry Christmas and Best Wishes for the New Year from the AE Staff!

Kenneth E. Trombley

Editor

LETTERS

(*Continued from page 4*)

Coverage of our experimental course in engineering practice combines three basic features, i.e., professionalism, self-interest and patriotism.

There is nothing that is especially new or novel in Mr. Lenz' arguments or, for that matter, in President Hull's reply. As an organized profession we can easily keep ourselves alert with respect to current developments in foreign relations and in domestic affairs that have been made complicated by engineered products and engineering know-how. By doing this we automatically achieve the variety needed to enhance the persuasiveness and logic not only to promote a professional philosophy but to maintain a level of engineering practice whereby we are accepted and can work on equal terms with the members of other professions ("including business administration or economics") and their professional societies.

MARION B. RICHARDSON, P.E.
Professor & Chairman,
Dept. of Industrial Engineering,
North Dakota State College,
Fargo, North Dakota

P.E.'s and Taxes . . .

Dear Editor:

The suggestions made by Maurice E. Peloubet, CPA, in his article "Depreciation and the Engineer—A missed Opportunity" in the September issue, are in my opinion very good.

The Internal Revenue Service has long ago recognized the importance of the engineer in problems involving the useful life of manufacturing equipment and their values. Taxpayers should be encouraged to rely to a greater extent upon the talents of their engineering personnel in solving the depreciation and valuation problems involving manufacturing plants and equipment.

I know that it would be helpful in my own work if the taxpayer, would invoke the aid of its own engineering personnel to support its claims for depreciation rates or valuation claims.

JOHN PALASICS, P.E.
Cleveland, Ohio

Status Quo? . . .

Dear Editor:

In the widespread public discussion of engineering education in recent years, the following considerations do not seem to have been recognized.

At the time engineering was being established as a profession, the person called an engineer was, in fact, an applied scientist. His concern was with the solutions to the problems of society, rather than with the search for new knowledge, and his tools included all that science had to offer. His approach was necessarily modified by the fact that he required a concrete (perhaps literally) answer, whether or not one was provided by the science of his day. He was therefore well grounded in chemistry, physics, and mathematics, and had not many "practical" or "applied" courses, since the practice and application had not been formalized.

It remained for later generations to freeze the education and training of engineers into the pattern which has existed until today. The profession of engineering has become corrupted through the practice of training each class to fill their predecessors' shoes. The new graduate is expected to know as much as possible of the details of his practice, then to spend some years in apprenticeship learning the details of his specialty as it now exists. This is the profession which all of us, now active, entered at the time of going to work with the B. S. degree.

In furthering this new practice, contemporary advances in physics, chemistry, and mathematics had, of necessity, to be ignored if the engineering student was to graduate in four years. As years passed, with more and more problems being reduced to practice, this approach became more and more difficult to support. Many institutions have been able to continue it by addition of a year to the undergraduate program. Such procedure suggests that still another year will eventually be required, and leads to visions of a ten-year program for the B. S. in some future generation.

In the recent past, changes in the present approach have led to much curriculum revision, producing increased science content. These revisions are usually found to conflict with respect for tradition and with the ways of thinking of established engineers. The compromises which result are not usually satisfactory to anyone, although they may represent real improvements.

These observations suggest that engineering has not retained its original position during this century. Instead, it has remained essentially stationary in level, while the natural tools of the profession were being further developed, but not used. The net result is a large and unnecessary loss in stature and in level of work by engineers. This is dramatically illustrated by the rise of trade unions in engineering, which could not occur if the engineer was a true professional. Suggestions for increased curriculum content in the basic sciences represent a return to the earliest and highest traditions of the profession, and should be encouraged.

R. P. EGERMEIER, P.E.
University Park, N. Mex.

Today's Engineers . . .

Dear Editor:

We have read several letters in the October, 1960, issue relating to unionism and the trials and tribulations of job seeking on the part of a graduate engineer, which have prompted us to make the following observations.

During the past ten years there has been a distinct trend on the part of graduating engineers toward the welfare state philosophy; job security, job benefits, short hours, furlough time and all the other sugar coating which today appears to be *de rigueur*. The enormous strides labor unions have made in these areas have, of course, left their mark. If an untrained laborer is paid for staying home, why then cannot the engineer receive equal or greater benefits? This, in the main, has been the attitude exhibited by many job candidates interviewed by us.

Paralleling our growing economy, engineering wages have doubled and tripled during the past decade. However, the value of engineers who have received the largest increase, those out of school less than five years, has gone up not at all. As a result, engineering firms, finding themselves in

(*Continued on page 53*)

AE Meetings of Note

American Institute of Chemical Engineers—Annual Meeting, December 4-7, Statler Hotel, Washington, D. C.

American Rocket Society—Annual Meeting, December 5-8, Shoreham Hotel, Washington, D. C.

Society of Automotive Engineers—Annual Meeting, January 9-13, Cobo Hall, Detroit, Michigan.

Society of Plastics Engineers—Annual Technical Meeting, January 24-27, Willard Hotel, Washington, D. C.

American Institute of Electrical Engineers—Winter General Meeting, January 29-February 3, New York, New York.

Strictly Business

Personalities . . . **William G. Sultan** has joined **General Microwave Corporation** as chief mechanical engineer . . . **Glen Moorehouse** has been appointed chairman of the American Association of Cost Engineers' Cost Index Committee . . . Announcement has been made of **W. T. Thagard's** election to vice president of **Texas Eastern Transmission Corp.** . . . The appointment of **R. L. Burger** to vice president of **Logansport Machine Company** has been announced . . . **Richard B. Le Vino** has been elected vice president of research and engineering of **Smith-Corona Marchant Inc.** . . . **L. C. "Pat" Henry** has moved from the position of chief engineer for Sanitary District 1 in Tucson, Ariz., to his own consulting office in the same city . . . **Henry C. Daum** has been appointed vice president in charge of sales at **Buhr Machine Tool Co.** . . . **Frank W. Reynolds,** manager of **IBM's Plastics Laboratory,** has been elected 1961 president of the Society of Plastics Engineers . . . **Harland Bartholomew and Associates** has established a Memphis office under the direction of **William S. Pollard Jr.** . . . **Paul G. Garrity** will head the new **Bentley Lighter Corporation** . . . **John F. Hinchey** has been appointed director of quality control for **Pacific Semiconductors, Inc.**

Mr. Sultan

The election of **William Butler III** as a vice president of **Bell Intercontinental Corp.** has been announced . . . **Frank J. Nunlist** has been appointed to the new position of vice president in charge of operations at **Worthington Corp.** . . . **George J. Laurent** has been named executive vice president of **General Atronics Corp.** . . . Two new vice presidents of **Hooker Chemical Corp.** are **Dr. Chris A. Steigman** and **Charles C. Hornbostel** . . . **A. Clifford Thornton** has been elected vice president in charge of personnel at **Yale and Towne Manufacturing Company** . . . **Dr. Louis R. Lavine** will head programming research and development for **Philco Corporation's Computer Division** . . . **Walter Green** has been named vice president of administration of **Engineers Incorporated** . . . **Richard M. Staff** has been appointed assistant to the president of **Eastern Rolling Mills, Inc.** . . . The appointments of **John L. Hallett** and **Louis H. Oppenheim** as vice presidents of **Kaiser Industries Corp.** and of **Franklin T. Matthias** as vice president of **Henry J. Kaiser Company** have been announced . . . **William E. Peterson,** formerly with Andersen-Bjornstad-Kane Consulting Engineers has opened his own office in Seattle.

Mr. Butler, III

Richard S. Kelly has been appointed chief engineer in the Los Angeles regional office of **Hewitt-Robins Incorporated** . . . **Robert A. Gingrich** has been appointed plant manager of **Hoffman Electronics Corp., Military Products Division** . . . **Leonard E. Van Houten** will now serve as a vice president of **Frederic R. Harris, Inc.** . . . **Schaevitz Engineering** has named **Dr. Juls Miller** as head of the new **Fractional HP Motor Department** . . . **Ralph C. Teague** has been named to the newly created position of field sales manager for **Copr-Fibre Building Insulations** . . . **U.S. Rubber Reclaiming Co.** has named **Thomas A. Galvin** manager of its new plant at Vicksburg, Miss. . . . Appointment of **Lawrence M. Farrell** to the position of general construction engineer for **Vollmar Bros. Construction Co.** has been announced . . . **Adler Electronics Inc.** has named **Adeline L. Jennings** as director of administrative services . . . **Joseph L. Tomaselli** has been appointed division industrial engineer for the **Electricweld Tube Division of Jones and Laughlin Steel Corp.** . . . **Douglas McArthur** has been appointed controller of the **M. and T. Company** of Philadelphia.

Mr. Kelly

A. F. Sammet has joined **Autonetics,** a division of **North American Aviation, Inc.,** as assistant to the vice president of industrial products . . . **Polarad Electronics Corp.** has appointed **Joe P. Schindler** as director of marketing . . . **William L. Davis** has been elected executive vice president of **Emerson Electric Manufacturing Company** . . . **Peter Lillys** has been made supervisor of the **Syracuse Research Laboratory of Crucible Steel Company of America** . . . **Atlee Corporation** has named **Bernard J. Warren** as manager of development engineering . . . The appointment of **John Gammell** as director of professional development, and of **John T. Graham** as director of graduate training has been announced by **Allis-Chalmers Industries Group** . . . The appointment of **Hans M. Klopfer** as export sales manager for **Loewy Products** has been announced by the **Industrial Equipment Division of Baldwin-Lima-Hamilton Corporation** . . . **Robert L. Daileader** has been named sales representative for the **Silicone Products Department of the General Electric Company** . . . **Dr. Sidney Bowhill** has been elected to the board of directors of **Dorne and Margolin, Inc.** . . . **Georges de Henau** has recently joined Badger N.V., Dutch affiliate of **Badger Manufacturing Company** as executive sales engineer.

Mr. Sammet

Competition for Engineers And Scientists Increases

An increase in the competition for engineers and scientists may be underway, according to Deutsch & Shea, Inc., technical manpower consultants. The Engineer/Scientist Demand Index developed by the firm shows a better than 10% increase in demand, measured by the volume of recruitment advertising in 27 newspapers in twenty major market areas and sixteen key journals in various technical and scientific fields.

Two measures of demand are used by Deutsch & Shea in analyzing current trends in recruitment. One is a Composite Index combining data on the numbers of ads and the amount of linage placed in both newspapers and technical journals. This Composite Index has been maintained for the past three months. It shows that September demand has risen 7.7 per cent over the base month of July 10.1 per cent over the preceding month, August.

Though not large, statistically speaking, the September upswing is significant as the first upward trend in demand since May of this year. Whether this marks simply the normal resumption of corporate recruiting of professional men after the summer hiatus, or indicates a more intense renewal of competition for the supply of engineers and scientists cannot yet be assessed.

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Redstone Rocket Might Have Won Space Race

America "almost certainly" would have had a satellite in orbit before the Russians had it elected in 1955 to use the existing Army Redstone rocket "rather than depend upon the development of a new rocket under a Navy contract in their proposed project Vanguard."

This opinion was expressed by Dr. Clifford C. Furnas, Chancellor of the University of Buffalo, in an address before the Eighth Annual Engineering Management Conference meeting in Chicago.

In December, 1955, Dr. Furnas was named Assistant Secretary of Defense for Research and Development, and prior to this appointment he had served as a member of the "very secret" committee which advised the then Assistant Secretary on the technical feasibility and desirability of launching an instrument-carrying earth-satellite during the geophysical year.

It was the unanimous opinion of this committee, he said, "that such a project . . . at that time would be a bit premature" from the scientific and engineering points of view. "However, in view of the international situation, it was decided the project should go forward even though technical success at that early period was by no means assured," he said.

Dr. Furnas was one of a trio on this committee of nine which turned in "a very strong minority report questioning the wisdom of the rocket system which the majority recommended for putting up the first satellite."

Subsequently, he recalled, the minority opinion, "almost without question, was the sounder one, at least as far as time schedule was concerned. Had the minority group's recommendation been followed, America would almost certainly have had a satellite in orbit before the Russians."

Had this been accomplished, he said, "many events in the last three years would have been very different—perhaps significantly so."

In his talk Dr. Furnas concerned himself with "The Social and Political Forces Impinging on Engineering Management." He recalled this committee service as an instance when international politics "was the decisive factor in what was at first glance an engineering matter."

He further made the judgment that the U.S. "in the scientifically worth while aspects of satelliting . . . is . . . now well ahead of the Russians," even though the U.S.S.R. still sends aloft objects of greater weight.

Continuing his talk Dr. Furnas also discussed the socio-political effect of the race for space on the nation, stating that it has created an awareness of the need for further development and an earnest desire to move ahead quickly.

Bridge-Tunnel Finishes N.Y.-Fla. Ocean Hiway

Scheduled for completion in the fall of 1963, the bridge-tunnel—to be built without the expenditure of any tax funds—will replace the Little Creek-Kiptopeke ferry fleet. It will eliminate the last water barrier on the popular Ocean Hiway (U. S. Routes 13 and 17) between N. Y. and Florida. In the first full year of operation, Wilbur Smith and Associates, traffic engineers, estimate 1,835,000 vehicles will use the bridge-tunnel and by 1978 the annual total is expected to reach 3,218,000.

Conference Calls for 'Balance in Industry'

A better balance between the managerial and technical aspects of maintenance will feature the 1961 Plant Maintenance & Engineering Conference, according to General Chairman L. C. Morrow, consulting editor of "Factory."

The conference will be held during the first three days of the four-day Plant Maintenance & Engineering Show in Chicago Jan. 23 through 26. The exposition and morning sessions of the conference will be held at the International Amphitheatre. Evening sessions of the conference will be held at the Palmer House.

Both events are produced by Clapp & Poliak, Inc., New York, exposition management firm. The show is one of the largest annual industrial expositions in the country. The exhibit area will exceed six acres and about 375 major companies are expected to exhibit. Theme for the 1961 show and conference is "The Maintenance Operation Meets the Needs of Increased Production."

Topics for the major sessions are "The Design, Application and Results of Our Plant Maintenance and Engineering System," "Case Reports in Preventive Maintenance," "Managerial Controls for Plant and Maintenance Engineers" and "Evaluation of Plant Engineering and Maintenance Performance."

Canadian Chosen 1961 AIMME Head

Ronald R. McNaughton of Trail, British Columbia, a Canadian metallurgist, has been elected to take office in February as the 1961 president of the American Institute of Mining, Metallurgical and Petroleum Engineers.

McNaughton will take office during the Institute's annual meeting in St. Louis, Mo. Born in Vancouver, B.C., he graduated in 1923 from McGill University and the following year joined Consolidated Mining and Smelting to remain with them to date.

He succeeds Dr. Joseph L. Gillson, Wilmington, Del., formerly with du Pont de Nemours & Co.

New Highway in Holland Has No Speed Limit

Highway lighting to unusual levels was reported at the recent annual meeting of the U.S. National Committee of the International Commission on Illumination, at Nittany Lion Inn, State College, Pa.

Of interest to both the highway industry and the motoring public, was the installation reported by John W. Young, Consulting Engineer of Boston, Mass. Mr. Young is Chairman of the Street Lighting Committee of the United States National Committee.

Recently returned from Europe, he had observed the latest highway lighting installation in Holland—a new four-lane divided highway between Rotterdam and The Hague. Continuous lighting to an average of three foot candles maintained is provided the entire route, at least three times that of the best similar lighting in the United States.

The new Dutch highway has no speed limit. Lighting is from four sodium lamps mounted on 40-foot poles located in the center dividing strip which delivers some 85,000 lumens per pole, compared with U.S. practice of 20,000 lumens per pole.

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(Circle 3 in Readers' Service Dept.)

Construction Starts on Chesapeake Bay Bridge

Construction started in Norfolk, Va., on the world's longest bridge-tunnel—the 17 and one-half crossing of Lower Chesapeake Bay.

In a ceremony conducted at the mouth of the bay, Lucius J. Kellam, Chairman of the Chesapeake Bay Bridge and Tunnel Commission, gave the order to drive the first of the 3,000 concrete piles required for the project. The $200-million crossing will provide the first highway link between the southern tip of Virginia's Eastern Shore and Norfolk, the Commonwealth's largest city.

Approximately 1,100 persons, including Federal, State, and local dignitaries, watched the start of on-site construction from aboard the S. S. Pocahontas, the 367-foot-long flagship of the Little Creek-Kiptopeke ferry fleet.

NSF Offers Graduate Fellowships to Engineers

Engineering is one of the fields in which the National Science Foundation is offering postdoctoral fellowships. Applications for the fellowships will be accepted through December 19, 1960.

Under the program a yearly stipend of $4500 is made to successful applicants with additional dependency allowances made for married students. Costs for travel are also available in some cases. Besides engineering, scholarships in natural and physical as well as some social sciences will be awarded.

Information about eligibility may be obtained from the National Academy of Sciences, Washington 25, D.C.

Move for Engineers' Unions Encounters New Set-backs

While one big industrial union after another lays plans to organize new units of employed engineers, recent set backs have caused union officials to admit that the movement is in trouble.

Published statements by two independent engineering unions issued in the wake of the recent union decertification at Sperry Gyroscope, reveal an undercurrent of uncertainty behind recent union expressions of confidence.

The official newsletter of the Lockheed Section of the Engineers & Scientists Guild describes the union situation as "grim," and sees the defeat of the Sperry Engineers Association as "just the latest in an alarming series of setbacks suffered by engineering unions in the past few years."

A more direct cause of ESG's gloom may be closer to home, however. Referring to their attempts to pick up new units, the ESG states that "Our own valiant attempt to organize the Missiles Division (of Lockheed) is running far short of expectations," causing a shutdown of a branch set up specifically to organize the new unit.

On the national scene, ESG says that the Engineers and Scientists of America, a professionals-only national union, "will fade out of existence this month." Although ESA President Joseph Amann publicly denies any such evaporation of his organization, the ESG newsletter points out, "There have been no new units of any significance formed within the past several years . . . Even the AFL-CIO, with all its resources, has been completely unable to record any real progress."

A second independent union, the TVA Engineers Association, sees a parallel between the Sperry defeat and other recent decertifications at Minneapolis-Honeywell and Western Electric. TVAEA President Gene M. Wilhoite says that "each group made the same mistake, they underestimated the power of the non-member, and allowed their membership to drop so low that the non-member voted them out."

While admitting the back-to-the-wall position of the engineering union movement, the ESG hopefully entitles its statement "The Dark Before the Dawn?" and calls for increased strength through unity. "It should impress upon us our great need to preserve and to strengthen the fine organization we have worked so long and so hard to build. There are many who, even now, are frantically reaching for the panic button. Let us take a calm appraisal of our situation, and try to evaluate it rationally."

Costs for Recruiting Engineers Increase

A recent survey by the Manpower Utilization Subcommittee of the House Committee on Post Office and Civil Service reveals that turnover and recruiting costs for engineers and scientists are significantly higher in industrial firms doing predominantly Government work than in firms getting most of their business from private industry.

In 76 firms doing more than 50 per cent of their business with the U.S. Government, recruiting costs averaged $1,022 per engineer or scientist, while 26 other firms primarily engaged in commerical projects averaged only $751 for each new hire.

Although turnover rates posted by Government firms doing work for the Navy and Air Force were actually lower than similar rates in the commercial firms, Government firms working for the Army had such high rates that an analysis of the Subcommittee's figures shows the total turnover rate among all Government firms to be appreciably higher than for the commercial firms.

Although the report of the Subcommittee did not make any specific recommendations for legislation to bring the defense contractors' costs and turnover rates more in line with those of the predominantly commercial firms, a statement released by Subcommittee Chairman James C. Davis (D.-Ga.) points up the concern of Subcommittee members: "The Manpower Utilization Subcommittee has for sometime been most interested in the excessive use of tax money by contractors in the hiring of engineers and scientists for defense projects. The Subcommittee recognizes abnormally high recruiting costs as another factor in the excessive turnover of personnel. It is likewise recognized that excessive personnel turnover detracts significantly from the effective utilization of scientific and engineering talent in our defense effort.

"The high recruiting costs by many firms as well as the unusually heavy turnover of engineers and scientists in several companies, as reflected by this study, would certainly appear to warrant even more attention in negotiating contract costs and in specific auditing by the Military Departments. The high recruiting costs also clearly indicate that the companies concerned have not made proper use of the free public employment services provided by our Federal and State Governments."

Overtime for Salaried Professionals Is Low

Over fifty-one per cent of companies recently surveyed by the American Management Association compensate one or more groups of their salaried employees in some way for overtime work, but only 32 per cent give such compensation to their salaried professionals.

Of the 434 companies replying, 147 report that salaried professionals receive some form of overtime compensation. Straight time was the most popular form of compensation, receiving 53 mentions. Next most popular was time-and-a-half, mentioned on 34 replies, followed by the two-rate system (usually time-and-a-half up to a certain salary level, and straight time or less after that) used by 19 per cent.

Thirteen companies use a sliding scale which decreases as higher salary levels are reached, with no overtime compensation at all being the rule above the $12,000 mark.

Only six companies use the equal-time-off system, primarily because it does not alleviate the problem of above average work loads and in fact often aggravates it. None of the reporting companies give time-and-a-half off for overtime to professionals.

It was also noted that the larger the company, the more common and the more generous, overtime compensation was likely to be.

Engineers who go to work for a new company on a try-out basis cannot claim travel and living costs incurred during the test period as tax-deductible expenses, as is generally permitted employees working away from home on a temporary basis.

The Internal Revenue Service recently ruled that in such cases a new "tax home" had been established, even though the new employment may turn out to be temporary.

Starting Salaries for Engineering Grads Rise

A straightline extension of starting salaries received by University of Detroit engineering graduates indicates that by 1965 the school's engineering graduates can expect to start at $665 per month.

The prediction is based upon an increase in starting salaries from $321 per month in 1951 to $547 in 1960, as reported in "Ten Years of Their First Jobs After College 1951-1960," a survey of past senior classes by the U.D. placement department.

University of Detroit engineering students all gain working experience before graduation in the school's cooperative study program, which perhaps explains their above average starting figures. Average starting salaries for 1960 engineering graduates were about $525.

If this prediction holds true, it will represent a 107 per cent starting salary increase for U.D. graduates over the 14 year period. If inflation continues at the same rate as in the past, however, the actual increase in buying power will be 76 per cent, or about five and one-half per cent per year. The five and one-half per cent figure represents about twice the yearly national increase.

U.S. Selective Service Compared to USSR

A speaker at the American Institute of Electrical Engineers' Fall General Meeting in Chicago recently compared the Selective Service System's "drafting of young scientists into the armed services" to "trench warfare." Soviet Russia, on the other hand, "has a more realistic approach to its scientific and engineering manpower problem."

In a paper entitled, "Our Scientific and Engineering Manpower Problem," S. B. Ingram, director of technical employment at Bell Telephone Laboratories, Murray Hill, N. J., charged that except in "the case of an overriding military necessity . . . and for assignment to technical work which uses their technical capabilities to the fullest," the practice of drafting scientists and engineers is "anachronistic," and the Selective Service Act which permits it should be changed.

In Russia, "science and engineering place much higher on their scale of values than they do with us. Scientific and engineering careers carry more prestige and more money relative to other occupations than they do with us."

Moreover, according to Mr. Ingram, "the Russians are graduating 100,000 engineers a year compared with our 38,000. . . A much larger percentage of Russian university students is in science or engineering . . . Mathematics and science comprise a much larger percentage of the secondary school curriculum." He warned that "we would be foolish to be complacent in the face of such comparisons."

"What is needed is a new Selective Service law based on a new concept of service under which engineers and scientists may discharge their obligation through either civilian or military service as the public interest and the national welfare may require. Assignment to either type of service should be by local Selective Service Boards acting under directives from the Selective Service system."

As a possible solution to the manpower problem, Mr. Ingram suggested a three-fold attack: First, to increase the number of scientific and engineering graduates; second, to make the most efficient use of the scientists and engineers we have; and third, to improve the quality of our scientists and engineers at the highest level.

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Consulting Meetings Prove Successful; May Plan More

Reports from three more regional meetings for consultants indicate that the new program is well off the ground. The possibility of future meetings is already being discussed in one region.

Reports have been received on meetings held in the Southeast, Northeast, and North Central Regions, with the Western meeting scheduled for November 4th in Boise, Idaho. The latest meetings were planned and carried out under the direction of Northeastern Vice-Chairman Philip W. Genovese, Southeastern Vice-Chairman George S. Rawlins, and North Central Vice-Chairman Stanley A. Michael. The Southeastern meeting was held in Atlanta on September 29th, the Northeastern meeting in New York on October 14th, and the North Central meeting in Omaha on October 6th.

Specific subjects discussed at the three meetings included the following:

- As at the two previous meetings, the proposal for an accreditation system for highway consulting engineers was felt to be undesirable in its present form.
- It was generally felt that much duplication of effort resulted from the overlapping actions of various consulting groups at the local and national levels. Various suggestions were forwarded to increase the effectiveness of programs through cooperation among different groups.
- Most of those present at the meetings felt that financing of additional programs at the national level could best be handled at the state level rather than by direct requests for contributions from the national section.
- It was recommended at the Northeastern meeting that greater emphasis be placed on development of programs for employees of consultants.
- Many consultants present at the meetings were not clear on the degree of autonomy properly held by functional sections. It was brought out that immediate action could be taken by functional sections when there was no question of possible conflict with state or national society policy.
- The three Regional vice-chairmen stressed the need for state and local support of the role of the consulting engineer in federal public works projects through local contacts with U.S. senators and representatives.

The enthusiastic participation and spirited discussions at the five regional meetings have indicated that the meetings can go far in providing needed communication and exchange of ideas among the various consultant groups, especially at the inter-state level. Don Schnacke, secretary-manager of the highly successful Kansas functional section, spoke at both the Southeastern and North Central meetings, pointing out types of programs and methods for strengthening state section activities. Speaking to those attending the Southeastern meeting, Schnacke outlined some of the successful programs of his section and said, "If Kansas can do it, so can everybody here."

Contract Awarded to Plan City of Anchorage

The engineering and planning firm of Wilsey, Ham & Blair, has been awarded a contract for preparation of a 20-year plan to guide growth of the City of Anchorage, Alaska.

Announcement of the award was made today by Lee E. Ham, president of the engineering and planning organization. Work on the contract, now underway, is scheduled for completion next spring, he reported.

Under terms of the contract, Wilsey, Ham & Blair will provide a general plan for logical and orderly growth of the city and adjoining metropolitan area through 1980, and specific plans for a civic center, central business district and all public utilities. This work will be reviewed and used by the Anchorage Department and the City Planning Commission as a basis for preparing the 5-year capital program and the capital budget for the city.

Present population of the Anchorage incorporated area is approximately 43,760 up some 288 per cent from the 11,254 recorded for 1950. Population of the overall metropolitan area, including the city proper, is approximately 82,325. Area of the present city and environs included in the study is approximately 100 square miles. Population projections for the area for 1980, prepared by other firms and agencies, have ranged from 200,000 to 800,000 persons.

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Canadian Association Publishes Fee Schedule

The Consulting Engineers' Division of the Association of Professional Engineers of British Columbia has published a "Schedule of Minimum Fees to Architects," and a memo covering policies to be followed in forming combined practices between engineers and architects.

The "Schedule of Minimum Fees to Architects," includes provisions for five categories of work broken down as follows: Class I Service—New Construction; Class II Service—Alterations and Repairs; Class III Service—Day Rates with Staff; Class IIIA Service—Service-Cost-Plus Allowances; Class IV Service—Day Rates, Individual.

In addition, the schedule provides a guide to consultants in handling change orders, expenses, specifications and plans, and termination of engagements.

For further information contact the Consulting Engineers' Division of the Association of Professional Engineers of British Columbia, 2210 West 12th Avenue, Vancouver 9, B.C.

Surveyors' Conference Set at Penn State

To bring engineers and surveyors up to date on the latest developments in surveying, a three-day conference for land and construction surveyors will be held at the Pennsylvania State University at University Park, Pennsylvania, on January 16-18.

The course will present practical ideas and techniques for immediate application to working situations, afford an opportunity to discuss mutual problems in the field of surveying, and provide an opportunity to obtain up-to-date surveying knowledge.

Topics to be considered will include electronic digital computer applications, computer costs and management, legal aspects of land surveys, photogrammetry and its uses in tax mapping, control surveys, and subdivision planning.

Further information may be obtained from the Continuing Education Conference Center, the Pennsylvania State University, University Park, Pa.

Measure Principle May Save $1 Billion Yearly

The adoption of the modular measure principle may save the construction industry one billion dollars a year, a conference of standardization experts was told in New York recently.

The building industry has already accepted four modular standards, developed under the procedures of the American Standards Association. The Veterans Administration is using the modular system almost without exception in its hospital building program. There are, however, some sections of the industry who are still reluctant to accept modular dimensioning.

These points were made by E. A. Lundberg, president, Producers' Council, Inc., in his address at the final session of the Eleventh National Conference on Standards at the Sheraton-Atlantic Hotel. The three-day conference was sponsored by the American Standards Association.

Some architects are opposed to it, he continued, while others have found it offers distinct advantages. C. E. Silling, for example, who operates a flourishing business in West Virginia, started using modular back in 1948 and has been enjoying high profits ever since. Another architect testified that modular measure could be expected to reduce draftmen's dimensional errors by ninety per cent, and to cut drafting time by twenty per cent within the first year of application.

Missouri SPE Publishes Engineers' Service Guide

A four-part Engineering Services Guide recently released by the Missouri Society of Professional Engineers points out to city officials the advantages of retaining registered professional engineers to perform city design work.

The Guide outlines the mutual responsibilities of engineers and city officials, and lists the advantages of retaining registered engineers for services in connection with all types of city projects. It may be mailed to city officials by consultants along with a covering letter or card.

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Specialization Is the Task of Industry, Not College

"It is usually inefficient to provide narrowly specialized training in the graduate school—because business can do this job itself better and more economically," Theodore O. Yntema, vice president for finance of the Ford Motor Co., declared recently at The University of Michigan, Ann Arbor, Mich.

"Only if there are numerous small businesses with the same highly specialized training requirement should the university consider meeting such demands," he explained at the 14th annual Conference on Higher Education.

"Unless the subject is highly important of itself (e.g., specialized surgery) or widely needed, narrow vocational training should not be given in our graduate schools," Yntema said. "We do not want people with trade school training, or even people who, as the old saw goes, know more and more about less and less—people who are lost as soon as they find themselves outside their narrow specialty.

"We need people who can deal with real problems—problems sometimes quite theoretical and abstract, and problems often beset by confusing factors and economic limitations . . . people who can see and solve problems, and who can cooperate and communicate with others in the process. We want people who have not been narrowed by their graduate training, and can do more than repeat facts and parrot theories and tilt with hypothetical windmills."

There are common factors in the education and careers of such professions as those of the physicist, chemist, economist, lawyer or doctor, Yntema said, adding that nearly everybody shares their use on some scale.

"The most important part of the scientific method is the part most neglected in formal education—namely, seeing problems," Yntema explained. "In my experience, most graduate students are rarely, if ever, expected to engage in intellectual exploration. They are expected to learn facts and theories and techniques . . . to apply their theories to cases. But they are hardly ever expected to discover a problem or ask an original question.

"I am not quite sure how we can get people to learn invention—but I am sure it is possible. And I am sure that most education discourages the process. The inquiring mind should be nurtured, not neglected, in elementary school, in high school and in college."

Yntema suggested such techniques as having graduate seminars on "unsolved problems" and allowing graduate students to find themselves "ten good thesis topics instead of merely delegating them a part of the professor's research."

Organization will allow the educated man to marshal the weight of his education behind inquiry and problem solving, Yntema continued, while learning to communicate and work with others will make him more effective.

Stevens Plans New Course for Engineers

How can you turn out articulate scientists and engineers? Everybody talks about the professional man's inability to tell others precisely what's on his mind, but nobody does anything about it.

Stevens Institute of Technology is taking a fresh approach to this problem by requiring a new freshman writing course that cuts beneath the superficial answers of more grammar and increased vocabulary. The course, the first of its kind in an engineering college, requires students to recognize how much their attitudes and prejudices have shaped their awareness of things around them, whether they are writing about their adjustment to college life, a Van Gogh painting or Einstein's theory of relativity.

The same method used in science and engineering is applied to writing. The students learn that men like Einstein and Newton first had to structure their own thoughts and to decide on a point of view, before they could express order in the physical universe. Several students have already reported that the course helped them in solving physics problems.

Research Team Studies Moon with New Drill

It's not "How high the moon?" but "how hard?"

That's one of the scientific problems facing a research team of Armour Research Foundation which is in the first stages of designing a device for automated drilling on the moon.

The "moon drill" would be operated from a spacecraft placed on the moon. The U.S. is planning to send several unmanned vehicles to the moon in the next two or three years to gather scientific and technical information.

The moon's hardness is only one of many factors that ARF researchers will have to consider. Others are:

- Extreme temperature conditions—during the lunar day, the surface temperature can reach 276°F., and it can drop to 184°F. below zero during the lunar night. (Lunar days and nights have a duration of about two weeks.)
- Atmospheric pressure—as far as scientists know, the moon's surface is almost a vacuum. Therefore, it will be necessary to determine if the drill unit can work in this "vacuum," or whether it must be pressurized, with only the drill bit exposed.

• Weight, volume, and power requirements—the drilling unit will be designed to meet the over-all design needs of the spacecraft, as part of the National Aeronautics and Space Administration program. The magnitude of the primary power supply must be determined, as does the question as to whether the drill unit will be operated by hydraulic, explosive, reaction, electric, or vibratory means.

• Drilling methods—slow speed continuous drilling or high speed intermittent drilling? Researchers must consider subsurface drilling techniques, such as cable drilling, rotary drilling, and diamond drilling.

• Design and wear of the drill bit—some scientists believe that the moon is covered with layers of dust. The drilling unit must be able to drill through and retain samples of both rock and dust.

• Landing impact—drilling operations will be attempted on a "soft" landing on the moon, that is at a speed of about 30 feet per second. The impact of the landing will influence the size and shape of the drill unit and material choices.

The necessity for complete automation of the drill unit (means for replacing drill bits, telescoping the drill shaft or adding sections to it) also poses some problems. The "moon drill' will be outfitted with a telemetering device so that all information can be relayed to scientists on earth.

Engineering Doctorate Available at Newark

The trustees of Newark College of Engineering announced recently that the State Board of Education has granted the college authority to confer the degree of Doctor of Engineering Science in addition to the B.S. and M.S. degrees the college now offers in chemical, civil, electrical, industrial, management and mechanical engineering. The new doctoral program will be offered at first only in the fields of chemical and electrical engineering.

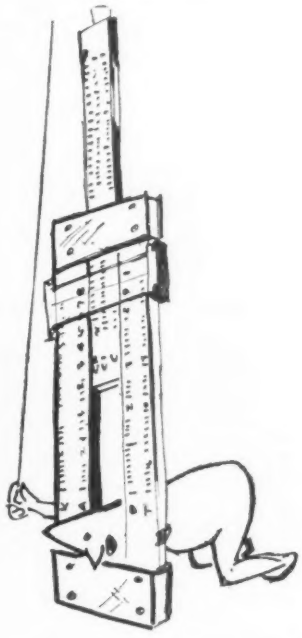
The State Board's authorization was transmitted to the trustees in the form of a four part resolution commending NCE for the quality of its facilities and faculty which, it said, "assures a rich program of advanced study culminating in the doctoral degree."

The chairmen of the two departments to offer the new degree are Dr. Charles L. Mantell, chemical engineering, and Dr. Frederick A. Russell, electrical engineering. Total staff for the two departments consists of 31 men.

Southern Universities Receive Ford Grants

A series of grants to strengthen and expand engineering education at the doctoral level in Southern universities was announced today by the Ford Foundation. They total $3,110,000 and will go to University of Florida, Georgia Institute of Technology, North Carolina State College, and the University of Texas.

The grants are aimed particularly at upgrading and expanding engineering education at the doctoral level, since the doctor's degree is considered essential for able engineering teachers and advanced research personnel. The four institutions receiving today's grants award nearly all the doctoral degrees in engineering in the South.



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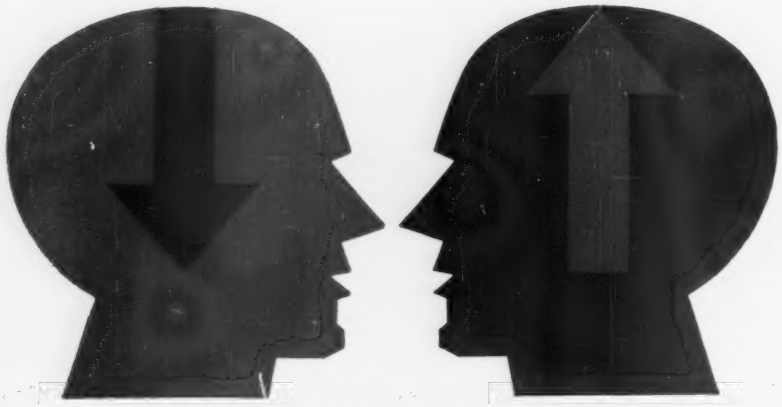
Chilean Engineers Rebuild After Quakes

Chilean engineers, rebuilding after last summer's earthquakes, will use jacks and double foundations to correct unequal settlement in some of their structures and to facilitate repair of future earthquake damage of this type.

This idea, described by one Chilean as "so simple and practical we wonder why we didn't think of it," was suggested by William S. Housel, a University of Michigan professor of civil engineering, who spent six weeks lecturing in Chile.

In the earthquakes there, buildings on alluvial deposits or on man-made fills suffered severe damage, he said, as these soils settled unevenly and "bent" and strained even well designed structures (hotels, office buildings) built on them. Much rebuilding will have to be done on these subsurface deposits of relatively loose soils; hence his suggestion.

Professor Housel suggested laying a concrete cap or "pad" on piles to serve as a substructure for supporting "grade beams" or piers on which the superstructure would rest. Jacks, or inserts for the future installation of jacks, would be built into the grade beams or piers. Uneven settlement then could easily be corrected—and the building made level again—by adjusting the jacks. "About the only objection to this idea is an instinctive dislike for having a 'permanent' structure on jacks," Professor Housel noted.



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A study of engineers and managers made by Opinion Research Corporation for the Professional Engineers Conference Board for Industry, in co-operation with the National Society of Professional Engineers.

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One out of four engineers in industry surveyed believes that engineers are thought of as second class professionals, but no industrial managers agree with this opinion.

Sixty-one per cent of the engineers employed in industry think there is considerable mal-utilization of engineers, but only 30 per cent of industrial managers agree.

More than half the engineers in industry think that higher pay would advance the engineering profession, but only 20 per cent of industrial managers agree.

Forty-four per cent of the engineers in companies which score high on efforts to encourage and develop high standards of engineering professionalism feel that management really believes in the professional status of engineers, while only seven per cent of the engineers in companies not scoring so high in such efforts agree with this.

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Maryland Appeals Court Backs Registration Board

In a significant decision, the Court of Appeals of Maryland has reversed a lower court order and reinstated the Registration Board's denial of a license to an applicant unless he passes the required written examination. The decision supports the Board's discretionary authority in passing on an applicant's qualifications for registration.

The position of the Board was vigorously supported by the Maryland Society of Professional Engineers in a "friend of the Court" brief, which was described as being "helpful to this Court" in its decision.

The dispute arose when J. W. Ruth, the vice president and assistant general manager of a well known contracting company, applied to the Board for registration as a professional engineer. Evidence submitted to the Board by Ruth showed that he holds a B.S. degree in industrial engineering from Pennsylvania State College and that his long association with the contracting company had given him extensive experience in grading, paving, bridge work, structural concrete and drainage work, plus substantial experience in the supervision of construction from layout to completion. Ruth's application was supported by written endorsements from his employer and by statements of several engineers that he is required to exercise engineering skills, ability and judgment. Ruth also furnished the Board the required references as to his character and reputation.

After considering Ruth's application, the Board ruled that it was unable to find sufficient evidence of basic engineering or design experience as required by law to grant registration, and that Ruth would have to take a written examination. This he refused to do, and subsequently filed suit to have the Board's position overruled.

The lower court agreed with Ruth and declared that the Board had tended to over-emphasize the creative work referred to in the Maryland Engineering Registration Law, and had placed too much stress on evidence that an applicant is actually engaged in the design and creative phases of engineering work. The court accepted Ruth's argument that his enlarged duties and responsibilities over the years had necessarily turned his professional activities away from design and creative drawing, adding that the Board had "unjustifiably" made this type of activity "an absolute prerequisite of the granting of a license." The lower court concluded that Ruth had submitted substantial evidence to meet the law, and that the Board's action was legally unjustified and legally arbitrary.

On this point, the Court of Appeals disagreed with the lower tribunal. "We find no indication of arbitrary action here," the Court said. "The Board followed the statute and sought such information as the statute required and in the exercise of its expert judgment found the applicant's evidence of his qualifications as to the kind of work in which he had experience not to measure up to the standard. . . . The Board applied, and properly applied, its expert knowledge to the evidence before it. We cannot find that in so doing, on the data before it, it reached a finding against the weight of the evidence, still less that it acted arbitrarily."

In support of its decision, the Court referred to the basic concept that a court is not to substitute its judgment for the experience of those persons who constitute the administrative agency from which the appeal is taken. Under the Maryland Act, the Court noted, the Board is to be composed of experts, and "we think it is manifest that substantial discretion is vested in the Board and that its members are to exercise it with the benefit of their expert knowledge."

The Court also took issue with the lower court's view that the Board failed to give sufficient weight to the recommendations of Ruth's references, by saying that both authority and responsibility rest with the Board. "If the Legislature had seen fit to make the right to registration depend upon the recommendations of non-Board members, it would have been quite simple to say so and wholly superfluous to require any investigative action on the part of the Board," the Court added.

In the course of its opinion, the Court observed that although engineering work and contracting work may and do overlap, they are by no means identical. "In a somewhat rough and general way, it may be said that in construction work, engineering is concerned with planning and design, including the making of necessary calculations incident thereto, and contracting is concerned with carrying plans and designs into practical effect." With this distinction in mind, the Court added that the Board "was correct in construing the statute as requiring that an applicant for registration as a professional engineer must show 'special knowledge of the mathematical and physical sciences and the principles and methods of engineering analysis and design,' and as requiring that an applicant must submit evidence satisfactory to the Board that he is competent to engage in the work of a professional engineer."

(State Board of Registration for Professional Engineers and Land Surveyors v. Ruth, Court of Appeals of Maryland, No. 33, September Term, 1960, November 11, 1960.)

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American Engineer

Engineering Goes To Work For SEATO

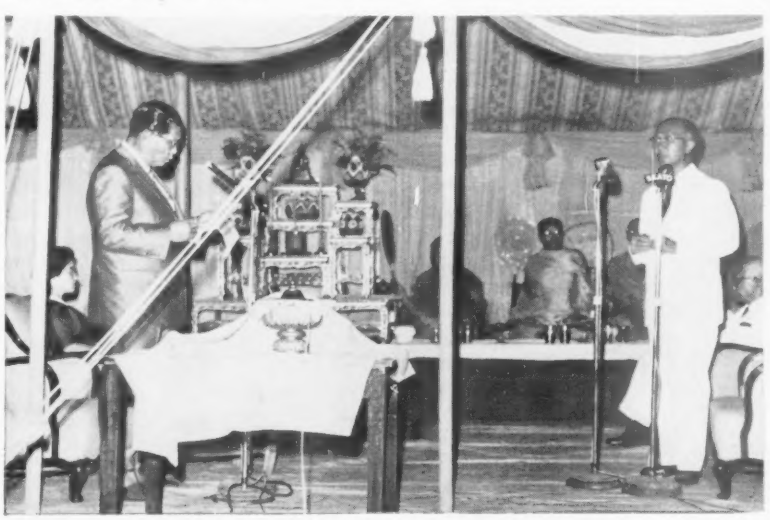
A Graduate School of Engineering in Bangkok Plays an Important Role in SEATO's Plan to Develop Southeast Asian Countries

THE South-East Asia Treaty Organization celebrated its fifth anniversary on September 8, 1959, by inaugurating a graduate school of engineering in Bangkok, Thailand.

The school was originally the idea of the Secretary-General of SEATO, Nai Pote Sarasin, who explained the project as being part of a pledge among the members of SEATO "to co-operate with one another for the further development of economic measures, including technical assistance, designed both to promote economic progress and social well being of member countries."

Sarasin first suggested the idea in the fall of 1957 and the matter was discussed at length before any action was taken. Money was acquired in 1958 and early the next year a contract was signed between Colorado State University and the International Co-operation Association whereby CSU agreed to plan the school and make arrangements

Prime Minister Sarit, left, and SEATO Secretary-General Sarasin participate in the dedication ceremonies at the school's opening on SEATO's fifth anniversary in 1959.



for its founding. Dr. Maurice Albertson, director of research at Colorado State University, was named campus co-ordinator for the school. Among other duties, it was his job to plan the initial curriculum and equipment that would be necessary, and to locate the professors to be sent from the United States.

Those participating in the school hope that the graduate training will answer a real need for qualified engineers in countries the school will serve, as there is a general lack of them in the area.

The school opened lacking some of the initial equipment, without a library and over two months behind the regular semester, but the appearance of 18 interested students, and the occasion of SEATO's fifth anniversary encouraged the premature inauguration. Students were willing to work rigorously during the next two months in order to finish one semester in half the time by taking double class and lab hours.

Bangkok was chosen as the site of the school for several reasons. Secretary-General Sarasin is one of

SEATO Graduate School of Engineering faculty in their robes during the inauguration of the School. Seated left to right they are: Dean Thomas H. Evans, assistant dean Uthai Voodhigula, Dr. Arthur Corey, Mr. Sol Resnick and Mr. Richard T. Shen. Standing are, l-r, Dr. Maurice Albertson, Dr. Chai Muktabhant, Dr. Marion Carsten and Dr. Rachot Kanchanavanij.

Countries asked were reluctant to release professors to teach in the SEATO school because they were so desperately needed at home. Students also had difficulty in being released from their countries to take time for the study tour. Due to the scarcity of engineers it is difficult to find a replacement for a student who wishes to take two years from a job to obtain a master's degree.

The school is affiliated academically with Chulalongkorn University and is built on land adjacent to the campus which was contributed by Thailand. Although organization and administration of the school must be consistent with those of Chulalongkorn, SEATO hopes to keep the school a separate entity.

the most enthusiastic supporters, and was willing to sponsor on behalf of his country generous contributions of land and buildings. Bangkok is a well advanced modern city, and an air transport center in Southeast Asia, perhaps more accessible from other parts of the area than any other city which could have been chosen. SEATO headquarters are also located in Bangkok.

The first major offered by the school was in hydraulics. For the present academic year, which began in June 1960 and will end in March 1961, structural and highway engineering have been added. Plans are underway to add sanitation to the curriculum in 1961-62 if financially possible.

The curriculum was planned in areas where Southeast Asia's needs are most acute. A team of officials and engineers in public and private practice determined the following areas of need. The curriculum committee then planned the courses bearing in mind that the advancement of countries involved depends on: (1) the optimum development, control and utilization of water resources; (2) the planning and development of transportation facilities and systems, particularly with respect to highways; (3) the planning and development of sanitary facilities and systems, particularly with respect to a pure water supply and sewage disposal; (4) the planning and development of power generation, transmission, and distribution systems for both rural and urban areas and for industry; (5) the planning and development of efficient communication systems; (6) the improvement of agricultural methods and techniques; and (7) planning for industrial development. Attempting to assist in meeting these needs gives to the school a large self-imposed responsibility.

Students eligible to attend the school are those from Borneo, Burma, Cambodia, Laos, Ceylon, India, Indonesia, Malaya, Singapore, Pakistan, The Philippines, Sarawak, South Vietnam, and Thailand.

For the present year there are 44 students—14 carryovers and 30 new students gleaned from over 100 applicants. The SEATO school has determined not to sacrifice the high standards they have established merely to fill the classrooms. A degree from this school will be comparable to the same degree if awarded in the United States, and will be of a high enough caliber to be acceptable in any country. In many cases students who had studied in a Southeast Asian country were lacking knowledge in important areas. To make up for the difference in standards between Asian and American schools, students were tutored or offered courses for no credit which would complete their backgrounds and prepare them for graduate work. Some such courses are fluid mechanics, soil mechanics and differential equations. Classes are taught in English and standard American

teaching methods are being employed.

The school had three major objectives for its first year in operation which were partially fulfilled. Their intention of getting on the regular Chulalongkorn University schedule by the beginning of the second semester (November 16, 1959) was realized. Plans called for a major in hydraulics engineering for as many as 25 students. As it turned out they had 18 students when the school opened and 28 at the year's close. They had also wanted students from all eligible SEATO countries, but fifteen of the first 18 were from Thailand.

Other countries are better represented in the second academic year. Making application for the present year were 67 students from Thailand, 49 from Pakistan, 2 from The Philippines, 2 from Indian, and 1 from Burma. Of the 44 new students accepted, 15 will study structural engineering, 8 to 10 will be in highways, and 10 to 12 in hydraulics.

The planners of the school set up three long term objectives. It will supplement a related SEATO program, namely the conversion of all vocational schools in the Asian member nations—Thailand, Pakistan and the Philippines—into modern industrial schools by offering opportunities for the brighter industrial students to acquire high level technical education. The school will support national programs by producing the technical men needed in industries and agriculture and finally to help produce for free Asia the technical and scientific personnel essential to industrial progress.

The use of English in classrooms limits the number of countries where professors might be found. Although English is common in many of the countries involved, it is difficult to find a professor who is fluent enough in both his native tongue and in English to be able to teach in the latter.

Dr. M. R. Carstens of Georgia Tech, who as Research Director is planning the hydraulics laboratory, hopes to make it the best equipped of its kind in the world. At present it ranks as one of the best in any Southeast Asian country, but Dr. Carstens is interested in obtaining only the most recent equipment. Most of the equipment so far has come from the United Kingdom which contributed 15,000 pounds' worth in equipment for the various labs. The United States has contributed some lab equipment, but most of our contributions have been in the form of money and staff.

At a reception for the faculty members of the SEATO School, Dr. Maurice Albertson, left, is greeted by T. Naughten, director of United States Operations Mission to Thailand. U.S. contributions to the school are funneled through USOM Thailand by ICA. Dean and Mrs. Thomas Evans look on in the center.

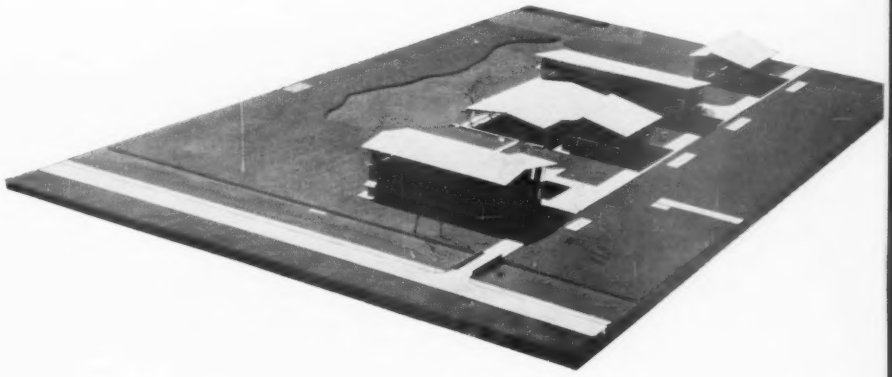
The initial contribution made by the United States was supplied from a special President's fund which was established in 1955 for aiding projects intended to improve countries in Asia.

The need to depend on congressional appropriations before hiring additional staff members from the United States, and the subsequent need to fill positions on short notice is an acute disadvantage in trying to recruit for overseas work. A two-year term is necessary, not only because of the cost involved in transporting a professor and his family to Bangkok, but also because it takes time for a professor to acclimate himself in the new surroundings and student body. Actually Bangkok is a modern city with much in the way of both conveniences and entertainment to offer the foreigner. Adjusting to life in this city is no great problem. American education is available for younger members of families working there.

In the future, contributions necessary to maintain the school will be considerably smaller than those needed for the initial establishment. However, the school will continue to be supported by SEATO member countries, and although revenue from the school will itself do much toward maintenance, those planning the school don't expect that the school will at any time be entirely self-supporting in the same way that American colleges and universities with their endowments are not *entirely* self-supporting.

During the first year it was necessary to supply every student with some kind of financial aid, rang-

This model of the SEATO school shows buildings which are planned or under construction. The main building, second from left, is completed and is shown on this month's cover.



ing from just transportation to total fees, board, and subsistence grants. With the increasing student body, of course, such extensive financial aid cannot continue. The United States through ICA, Australia, and New Zealand were able to supply the necessary scholarships during the first year, and to also supply grants for 30 students during the current year. Beyond that extent, however, other sources of scholarship aid are not yet available.

On the Chulalongkorn University campus three buildings make up the graduate school. Two are used exclusively by the graduate school while the third is owned by Chulalongkorn and used by both schools.

The undergraduate engineering library at Chulalongkorn was the only one available to the first students, which proved a handicap since the average undergraduate library is not extensive enough to serve the total research needs of a graduate student. Since then a graduate library has been started. Books and periodicals have been contributed by member countries, but the library is one area in which the school is still lacking. To build an extensive library that will serve the needs of thesis research takes time and money, both of which had to be spent developing other phases of the school during the first year. A contribution from the Philippines was used to hire a part-time librarian, but this will become a full time job as the library is expanded.

Because of the international character of the school, housing is a problem. School officials hope to be able to establish in the future a centralized housing development for both students and faculty which will take into account the various living habits and dietary practices requiring special treatment. Students are now housed in Chulalongkorn U. dormitories.

The school is run by a governing council appointed by SEATO and made up of representatives from the various SEATO countries who, it is hoped, will be influential in getting support for the school from their respective homelands. The Rector and Secretary-General of Chulalongkorn U. are on the advisory board of the school. It is also hoped that when qualified persons can be located, the faculty will take on a more international character.

Instigated in the hope of later providing some of their own faculty members, as well as aiding Southeast Asia, is a "participant training program" whereby especially qualified students are selected to continue their study for a doctorate in countries such as the United States where facilities are already available. Presently there are three students studying at American universities on this plan. Those sent must already hold a master's degree, and are expected to return to the SEATO school upon completion of their degrees. During vacations while in this country, they are urged to visit engineering organizations such as the U.S. Bureau of Reclamation, U.S. Bureau of Public Roads, the State Highway Departments, the Corps of Engineers, consulting engineering firms and the California Department of Water Resources, which will add to their training and background.

In order that the school will be of some assistance to engineers already in practice, the SEATO school has planned an "in-service" training program which consists of short courses and traveling lectures. Plans for the program also include correspondence and night classes. These will serve the employers or supervising engineers who are unable to leave their jobs for further education by bringing them up to date on the latest methods and developments. Lectures will be on subjects which have immediate application to Southeast Asia's needs. They will either be by men invited for the purpose or, on occasion, by any qualified person who happens to be in the area and is willing to donate the time. The possibility of offering correspondence courses as part of the same plan is also being considered, but is not in concrete form as of yet. Conferences in connection with this plan will be held on problems which arise with men on the job.

In such countries as Cambodia, Laos, and Vietnam the conferences and lectures will be conducted in French, but unless it is advantageous to use another language, English will be used for the in-service program as in the Bangkok school. Sessions have already been started in Thailand, but officials hope to expand them into all eligible countries.

The research and training at the school is intended to train students in the techniques of analyzing a problem, preparing a research plan

(Continued on page 54)

Professor A. T. Corey (left) and Secretary-General Sarasin (right) are shown here welcoming the Carsten family on their arrival in Bangkok. American education facilities are available for the children.

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

The New Administration ►

We are now in the interregnum and all waits for the Cabinet and other high level appointments, as well as the post-election further indication of the direction of Governmental policy which may be forthcoming.

During this period of pause there will be much speculation as to the future, based in large measure against the statements of President-elect Kennedy during the campaign. In weighing these prospects, however, it must be kept in mind that the election did not produce a sweeping change in the composition or temper of the Congress. In fact, whatever change occurred was in the direction of a somewhat more conservative membership. Thus, the conservative coalition which has predominated in recent years will still be in control or, at least, a major influence in the legislative outlook for the next two years.

There are some guidelines emerging from the campaign on matters of concern to the engineering profession, although the details remain to be spelled out in the series of forthcoming Presidential messages after Congress convenes in early January.

◄ *Defense Reorganization*

Senator Stuart Symington of Missouri was designated by Senator Kennedy shortly after his nomination to prepare a report on revamping the "cumbersome, antique and creaking machinery of the Defense Department." This study, assisted by an advisory committee of formerly highly placed defense officials, is reported to be about completed. It will presumably deal mainly with the structure of the military service, including recommendations on replacement of the Joint Chiefs of Staff with a single Chief, or at least an increase in authority for the Chairman of the Joint Chiefs.

The Symington study will reportedly also suggest greater emphasis on re-organization under a "functions or missions" concept. This phase of the plan could be highly significant for engineering and scientific activities, particularly in the research and development area. While it is unlikely to go so far, there have been suggestions from time to time that the technological complex of the military services be unified under one command and one budget. President-elect Kennedy has stated that the Symington group should study this approach and the Democratic platform geared its defense re-organization plank to reference to the impact of "the revolution in weapons technology."

Education ►

The new Administration will surely make a major effort to pass a school construction and aid-to-teachers'-salaries bill as promised during the campaign. In addition, the President-elect declared that his aim in higher education will be "to send to college all who want and deserve to go." He indicated that this would be sought through "far more scholarships, far more loans and the construction of more dormitories and classrooms." At one point President-elect Kennedy indicated that he would favor some 15-20,000 Federal scholarships for needy high school graduates, a proposal which was defeated in the enactment of the National Defense Education Act. If the idea is now revived it will raise a touchy issue of distinguishing between those who attend college on a loan basis and those who would not be required to repay the cost of their higher education. Vice President-elect Johnson, on the other hand, has been a strong advocate of Federal guarantees of private loans for those needing financial aid. In any event, aid to higher education will be a major domestic issue in the light of President-elect Kennedy's statement that the loss of 35 per cent of our

brightest high school graduates who are unable to afford the high cost of a college education is "the greatest waste of our natural resources. It shall not continue." The education issue is also bound to revive the argument about the number of engineers and scientists graduated in Russia each year, compared to the output in the United States.

Peace Corps ◄

In the 86th Congress bills were introduced to establish a Peace Corps or Point Four Corps composed mainly of young people who would volunteer to serve in overseas posts in the program of technical assistance to underdeveloped nations. President-elect Kennedy has embraced this idea, declaring that such an organization could be "a counter to the flood of well-trained and dedicated Communist technicians now helping these nations with their problems—an American 'peace corps'—a supplement to our selective service that now draws only a fraction of our young men and, as General Gavin and others point out, wastes the talents of many who are taken." He said the group would be trained to help underdeveloped countries help themselves—to show them modern agriculture, public health, road building, government and other skills. Service in the Peace Corps, he added, would be an alternative to the draft—a proposal certain to arouse strong opposition—but would also include older persons—"teachers and engineers forced to retire at 65, for example—who desire to devote a part of their lives not as soldiers of war, but as ambassadors of peace."

The outcome of this proposal will be influenced considerably by the findings of a special study authorized last year in the funds of the International Cooperation Administration. Only $10,000 was appropriated for the study by an outside private agency and it has proceeded slowly. With the election of Senator Kennedy, however, it may be expected that there will be pressure to speed up the study and recommendations and possibly an early supplemental appropriation to broaden the scope of the study.

Public Works ►

The new Administration will place heavier emphasis on expansion of Federal public works activities. Among those which were singled out for special attention during the campaign were a step-up in resource development, including dams and other water resource facilities. There will be suggestions for a series of broadened programs in housing measures and urban renewal programs. The water-pollution control program needs stepping up, President-elect Kennedy told the voters. There will also be a new battle over enactment of the depressed area legislation, the Democratic version of which was twice vetoed by President Eisenhower, and which included financial and technical assistance for depressed communities. Little was said during the campaign about the interstate highway program and it may be assumed that the present long-range program will not be the subject of major legislative interest, although there may be some consideration of its financing. Some legislators may undertake to convert the pay-as-you-go plan into one of appropriations out of general revenue.

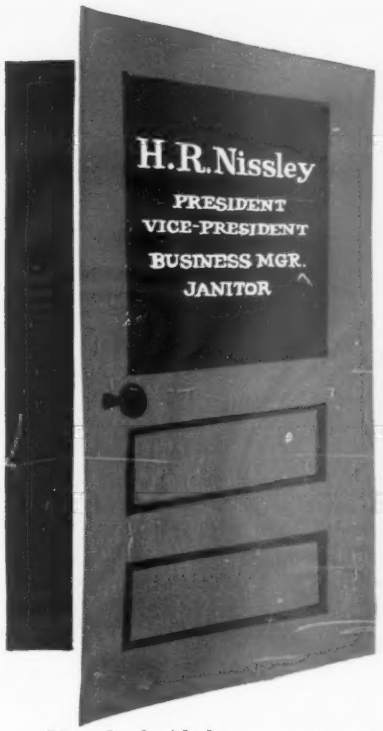
Science Organization ◄

The question of establishing a Science Department was not a campaign issue and does not particularly follow along party lines. No doubt it will be a subject of further congressional interest and may well be on the agenda of White House staff study for later recommendation. At one point it was reported that Senator Kennedy would embrace the idea, but so far he has not announced a position on the issue. An NSPE committee is making an extensive study of the entire science and engineering organization question and expects to have its report in the hands of the Administration and Congress early in 1961.

Common Situs Picketing ►

Both Senator Kennedy and Vice President Nixon endorsed the common situs picketing legislation during the campaign and this may take some of the opposition out of the past fight over it. Nevertheless, it will be a definite issue in the next Congress. NSPE, as in the 86th Congress, will seek to influence the legislative course in such a manner that engineers in the construction industry will be protected against forced unionization.

I Gave up my Job (Security) At the Age of 50 and Went into Business



By
HAROLD R. NISSLEY, P.E.
Consulting Engineer

DURING my sixteen years of university teaching and eight years of consulting work for a large corporation I had seen many frustrated men. They were unhappy with their jobs but they lacked the courage to change jobs. Many of these men crusaded for the free enterprise system, but most of them flunked the pragmatic test of trying it on their own.

Yet, as I approached the age of fifty (with two children in school) I, too, hesitated about leaving a good salaried job with many "fringe" benefits. In a few years I would receive a fair pension. I had ideal working conditions (even my secretary had wall-to-wall carpeting in her private office). I traveled freely, whenever and wherever I thought I could do some good. There were few restrictions on my "extra-curricular" activities; I was allowed to arbitrate an occasional labor-management dispute (outside the company); my company permitted me to do much professional society work. My regular annual salary increases dwarfed even the largest single raise I had received during my sixteen years of university teaching.

But what would happen to me and my job long after the lush war and postwar years? Many of my company conferrers boasted that this company was depression-proof. But was it? During a company job-selling campaign in which job security was stressed, I learned that this company's employment index for the past thirty years matched the employment index of all American manufacturers. Moreover, the past history of recessions showed that engineers and scientists were among the first people to be laid off when company retrenchments started.

In addition to my fears about my job future, there was the fear that my past freedom would be greatly curtailed. I thought I detected a centripetal swing toward greater home-office control (contrary to the announced company policy of decentralization).

In addition to these fears there were positive factors which prompted me to consider leaving one of the finest jobs I had ever held. In 1943 I had been hired to set up, for the first time, a motion and time study activity in a score of this company's factories. By 1951 this original main assignment was pretty well completed. With this assignment coming to an end, should I go outside my engineering profession and seek a managerial post with the company as my next step?

No, I decided my next step would be private consulting engineering practice. So in May, 1951, (after five months' notice) I left my job "security" and went into business for myself. But unlike others who had done the same thing, I did not have even one client to go to. Like most other entrepreneurs I had to develop my own business.

The summer of 1951 was spent in "visiting" friends and acquaintances in the hope that these people would open assignment doors for me. I soon learned, however, that my contacts were of little value to me because none of them were company presidents. And company presidents have more voice in the selection of part-time professional services than do works managers, personnel directors, and industrial engineers, my chief contacts. Could I or should I impose on my friendship with these contacts to gain me an audience with their company presidents?

Shortly, I learned that I could gain an audience with a company president more easily than I could with the help of a works manager contact. Moreover, my entrée into a chief executive's office, without the help of a friend, would not put any strain on a friendship.

But chief executives are busy men. They don't have the time to spend with strangers—even nice fellows who have gone into business for themselves! And to make matters worse I did not meet people easily. Slowly it became apparent to me why salesmen usually earn more than engineers.

During these early months I received a lot of advice from well-meaning friends and even from competing consulting engineers. Much of this advice was good, I thought. Some of it I rejected on moral grounds. A little of it I was able to test. I was, for example, told:

1. Executives respect size. Hence you must *not* appear as a one-man outfit. Rather you should appear as "Harold R. Nissley & Company", or "Harold R. Nissley & Associates."

2. Executives respect office location. You are doomed from the start, if you operate from your home—or appear to be operating from your home. You must get a downtown office location in some high-class office building; if this seems impractical at the start, you must at least get a telephone "space" in some high-grade office building.

I rejected both of these admonitions. I could not pretend to be something bigger than I was. If a client hired me to do a job only Harold Nissley (with a three-year-old Chevrolet) would turn up to do the job.

I did explore the office idea and finally rejected it, too. Such an office would be expensive and inconvenient. I rejected the downtown telephone number idea because of its misleading implications.

WITHIN six months I was able to test these two decisions. During the early part of an interview with a company president I was asked two questions: "(1) What is the size of your consulting firm?, and (2) Where is your office located (in Cleveland)?" This president had just told me he had served as vice president for one of Cleveland's largest consulting firms for fifteen years.

Holding up one finger I answered the first question by saying: "You are now talking to the janitor and president of the Harold Nissley Enterprises." (My wife tells me this statement is only half true!)

Still looking him straight in the eye I answered the second question by saying, "My office is located in the basement of my home."

I am sure these frank homespun answers to his questions played a part in this man's decision to have me do an important job for his company shortly afterwards.

Notwithstanding a few early successes, my expenses the first year just offset my income. But I was prepared to keep my home and family going the first year from past savings. However, when I had nothing left at the end of the second year with which to pay household expenses, I was really worried. Gradually, through the sale of securities, I saw a lifetime of savings dwindle.

During times like this it is easy for a man to wonder just who his friends are. Moreover, a deeply discouraged man starts to magnify his own weaknesses. Fortunately as a teetotaler I did not slip into the habit of drinking away my worries. And my teen-age children seemed to sense the gravity of my plight for they did not press me for anything.

There were, however, a few rays of sunshine that broke through my despair. Occasionally I would learn of help some of my former university and company associates were attempting to give me. Occasionally, too, some of my new top executive contacts would display unusual interest in me and even "open a door" for me. But the greatest help I received was from my wife. She would always convert dark situations into bright ones. Later she told me this was just plain graveyard whistling on her part. (She is such a convincing person that I believed her words of encouragement at the time.)

Thus, at the end of two years with nothing tangible to show for my efforts I was confronted with a major decision: Should I continue for another year or should I retire to the security of the university classroom? Two thoughts prompted me to go on: (1) An old admonition of my mother, "Never be a quitter," and (2) a curious desire to see my free enterprise experiment through to the very end.

My decision to go ahead was a wise one. My third year's business was twice the combined volume of my first two years. My net income this third year was twice my former company salary. And what was even more encouraging was the fact that much of this third year business was "referral" business (i.e., business recommended by satisfied clients).

A good share of my business growth is due, I am sure, to my strict adherence to the Golden Rule. I carried over into my one-man business my old working philosophy of giving my employer more in services than he was paying for. A few examples of this Golden Rule application might be of interest.

As an arbitrator in a labor-management dispute I awarded three out of four cases to a company. Instead of challenging these awards, the union protested to the Federal Mediation and Conciliation Service in Washington that I had overcharged them. The chief of the Mediation Service (with whom I had worked on arbitrations before he became chief) sent me a copy of the union's letter.

I sent the union president a blank check together with a friend-

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About the Author . . .

Mr. Nissley

Before starting his own business, Harold R. Nissley of Cleveland, Ohio, was with General Electric as a consulting engineer, and on the staff at Texas Tech., and Miami and Kent State Universities as a professor of engineering. He is a member of AIIE, NSPE, and the Industrial Management Society. He received his B.S. from Illinois Institute of Technology and his M.A. from the University of Chicago. Active in the profession he has participated in numerous panels and conferences.

ly letter and told him to fill in the check for the amount by which he thought his union had been overcharged. The president returned the check and asked me to fill it in for $110. I returned the blank check and told him I could not, in clear conscience, fill in the check for this amount. But I was quite willing to have the union be the judge about the fairness of my bill; I, therefore, urged him to fill in the amount by which he, or his executive committee, felt the union was overcharged. To make a long story short, this blank check went back and forth for weeks. Only after a new set of officers took office was it finally filled in by a new union treasurer.

WHENEVER a consulting engineer learns that a prospect is already being served by another consulting firm there are three courses of action open to him: (1) He can remain and stress his own specialties that may not be covered by the incumbent consulting firm; (2) He can leave and say nothing further, and (3) He can say: "You are in excellent hands; indeed, they can do more for you than I probably can"—and leave. I prefer the last of these (except in those few instances where I question the ethics or skill of the incumbent consulting firm; in such cases, I select the second course of action above).

Abiding by a rigid code of ethics has been rewarding, too. A few years ago I was surprised to learn that a company had selected me to arbitrate a second dispute after it had lost a decision from me on a previous dispute. Indeed, after losing the first case, the company bombarded me with threatening letters, somewhat unusual even for an arbitration loser.

On a *quid pro quo* basis I might have decided the second case in favor of the company. But I judged the second case solely on *its* merits. And on its merits, the second case went against the company. During the ensuing period of recrimination I finally told the company: "Do me a favor. Don't use me as an arbitrator in any more of your disputes." Much to my astonishment the company (and the union) asked me to arbitrate a third case a year later. And the third case went against the company! By this time I was well-prepared for the company's final salvo: "The reason we selected you to arbitrate this case after your two previous unfair decisions was we thought we would get at least one honest decision out of three arbitrations!"

Thus, the past eight years have been some of the most hazardous, exciting, and satisfying years of my thirty-three year working career. Not only have I been able to help many companies (and unions) solve some of their most difficult problems but I have made scores of new friends. These friends range all the way from floor sweepers to corporation board chairmen; from West Berlin business executives to Korean government officials. Indeed, aside from my improved financial status, these psychic dividends alone would go far in compensating me for my work during my eight years of "free enterprising."

I can never, of course, repay most of the people who helped me directly or indirectly—particularly my early university colleagues and my former company conferrers. But I attempt to pour back into the reservoir of human kindness and understanding a little of what I took out. Hardly a month goes by when I am not helping some unemployed engineer or executive to get relocated (occasionally this help extends to offers of interim financial assistance). Indeed, I am seldom too busy to help anyone who wishes help (including hitchhikers). And it is gratifying to see my children extend their helping hands to others —without any prompting on my part.

Hence, I commend to anyone crowding fifty who finds the pressure building up to take a pragmatic view of the free enterprise system. But anyone leaving a salaried job to go into business for himself should be financially and psychologically prepared for the dangers and heartaches that may lie ahead. Certainly no man should try it unless he has a stouthearted wife who has the capacity to do some convincing "graveyard whistling" when the going gets rough.—**End.**

LEGAL NOTICE

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946 AND JUNE 11, 1960 (74 Stat. 208) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

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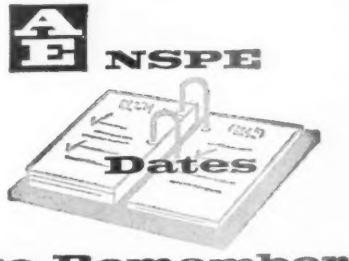
KENNETH E. TROMBLEY, Editor

Sworn to and subscribed before me this 3rd day of October, 1960.

(SEAL) MILTON F. LUNCH

(My commission expires September 14, 1962)



to Remember

Louisiana Engineering Society—Annual Meeting, January 12-13, Capitol House, Baton Rouge, Louisiana.

Mississippi Society— Annual Meeting, January 19-20, King Edwards Hotel, Jackson, Mississippi.

Texas Society— Annual Meeting, January 19-21, Windsor Hotel, Abilene, Texas.

Alaska Society of Professional Engineers—Annual Meeting, January 13, Anchorage, Alaska.

Idaho Society—Annual Meeting, February 3-4, Boise Hotel, Boise, Idaho.

Iowa Society—Annual Meeting, February 8-9, Hotel Fort Des Moines, Des Moines, Iowa.

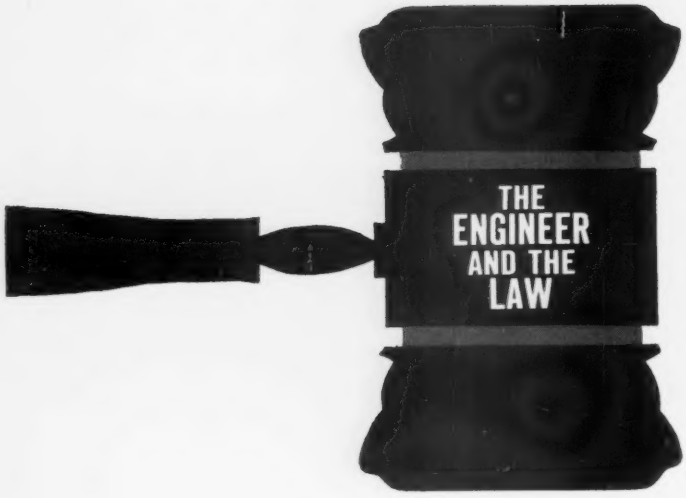
National Society of Professional Engineers—Winter Meeting, February 9-11, 1961, Hotel Ft. Des Moines, Des Moines, Iowa.

Minnesota Society—Annual Meeting, February 22-24, Pick-Nicollet Hotel, Minneapolis, Minnesota.

New Mexico Society — Annual Meeting, February 24-25, Santa Fe, New Mexico.

Kansas Engineering Society—Annual Meeting, February 24-25, Parrish Hotel, Great Bend, Kansas.

National Society of Professional Engineers—Annual Meeting, July 4-7, 1961, Olympic Hotel, Seattle, Washington.



California Court Decision Favors Engineer; Says He Is Not an 'Absolute Guarantor'

The duties and liabilities of a consulting civil engineer have been clarified in a recent appelate decision affirming the judgment of the Superior Court of Los Angeles County, California. In this case the court ruled that an engineer cannot be held to an absolute guarantor that satisfactory results will ensue from his work. Rather, his standard of performance requires only that he exercise that degree of skill and competence ordinarily possessed by other members of his profession.

The case arose when the engineer filed suit to recover sums claimed to be due him under a contract for engineering services in connection with the development of tracts of real property for subdivision. The engineer was engaged to prepare plans for grading streets and sewers, to make construction and field surveys and to perform other engineering functions.

Among other contentions, the defendant property owners claimed that the loss of a lot in a portion of the tract was due to the fact that the engineer had miscalculated in estimating the amount of earth involved in balancing the cut and fill and not because the area was insufficient. Expert testimony in the lower trial court pointed out that the custom and usage in the area was to rely on the experience of the engineer in estimating the shrinkage factor rather than on soil tests because it was difficult to secure enough data by soil tests to determine an accurate shrinkage factor. The engineer had testified that he expected the earth to shrink when, in fact, it expanded. On this basis, the court held that any error would be attributable to the engineering, rather than to any failure of the contractor to follow the plans.

In discussing the engineer's erroneous estimate of the shrinkage factor, the court declared that his undertaking in respect to the plans he prepares "is comparable to that of an architect, which in the absence of a special agreement is not an absolute guaranty that satisfactory results will ensue."

The court further noted that by his contract to furnish services, the engineer implied that he possessed the competence and ability ordinarily possessed by members of his profession. "In testing his competence, consideration is to be given to the knowledge employed by members of his profession at the time he was employed. No evidence is called to our attention showing that his estimate of the shrinkage factor was so inaccurate as to indicate that he did not have and employ at the time that degree of knowledge employed by other members of his profession."

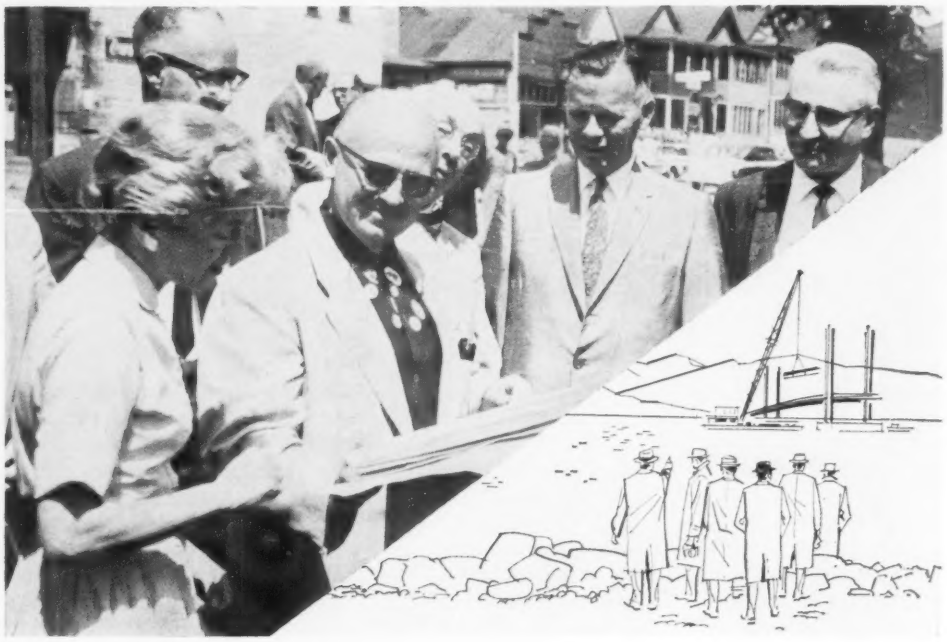
Quoting from another decision, the court added: "The services of experts are sought because of their special skill. They have a duty to exercise the ordinary skill and competence of members of their profession, and a failure to discharge that duty will subject them to liability for negligence. Those who hire such persons are not justified in expecting infallibility, but can expect only reasonable care and competence. They purchase service, not insurance."

In conclusion, the court ruled that whether the engineer failed to exercise reasonable care and diligence in performing the services he rendered was a question of fact which the lower court determined in the engineer's favor. "Those findings are fully supported by the evidence." (*Bonadiman-McCain, Inc. v. Snow*, 183 A.C.A. 56, 1960). **—End.**

Mandatory Society Membership Questioned

Can membership in a state professional society be imposed as a mandatory condition to obtaining a license to practice a profession? The constitutionality of such an arrangement is being challenged in the U. S. Supreme Court for the first time in a case involving the practice of law through an integrated bar in Wisconsin. The outcome of that controversy will have a bearing on the integrated practice of engineering, currently being considered in several states.

Professional Profiles



Architect Elizabeth Close, S. L. Stolte, Mayor K. P. Peterson of Minneapolis and Commissioner Edward Schwartz of the Housing and Redevelopment Authority of Minneapolis participate in a dedication ceremony.

In his profession "Sid" Stolte, P. E., is one of the country's busiest and most esteemed men. Years of public service and quality in professional activities done by this man confirm the old adage, "When you want something done, ask a busy man to do it."

He began his work just out of the University of Minnesota Institute of Technology in 1927 by designing the first reinforced concrete skyscraper in that part of the country. He moved into government work in 1934, but returned to private practice in 1943 as a partner in Bettenburg, Townsend, Stolte and Comb in St. Paul, Minn. His fields of specialization have become city planning, water and sewer systems and airport development while he also designs schools, hospitals, churches and armories.

Besides his profession, his public service record is one to be proud of. Since 1947 he has been commissioner of the Minneapolis Housing and Redevelopment Authority—at no salary—first as vice chairman and then as chairman. He also serves on an advisory committee of the Local Housing Authority Commission. Since 1948 Stolte has been vice chairman of Minnesota Good Roads, Inc., the "good roads vote" of the people to highway planners, the State Legislature, and the Congress.

For the past ten years he's been actively concerned with the problem of local, state, and Federal building codes, serving as chairman of the code committee of the League of Minnesota Municipalities, and as vice chairman of the Interim State Building Code Commission.

Currently he's on a joint committee of the Minnesota Society of Architects and the Minnesota School Board Association to draw up appropriate standards of professional services and contract relationships. He is also chief of the Logistics Division of the Engineering Section of the Department of Civil Defense for Minnesota. He has also been influential in making the Minneapolis City Planning Commission an effective force producing beneficial results for the city.

Stolte has held a presidency in just about every organization in his profession, including NSPE (1950-51), Minnesota SPE, Minnesota Society of Architects, and the Minneapolis chapter of Minnesota Federation of Engineering Societies. In 1947 he was presented the Minneapolis Star and Tribune's Leadership Award.

Stolte looks with pride on some of the major accomplishments in Minneapolis' housing and renewal program. Blighted areas have been reclaimed and upgraded, vital housing problems solved for thousands of residents, and a good business record chalked up for the city through tax collection and amortization projects.—**End.**

Why Government Agencies I
Their Own Engineer

By

FLOYD E. DOMINY

Commissioner, U. S. Bureau of Reclamation

As Commissioner of the Bureau of Reclamation, I am responsible for the direction of a large-scale water resource development program which derives much of its strength from professional engineering talent within our ranks. I am daily aware of the skills and accomplishments of engineers, and believe I can write objectively and—since my own professional training is not in engineering—from a perspective that may be of interest to you.

The engineer in Government service has been traditional and has contributed in large measure to our present-day accomplishments. Throughout the Federal Government there are employed about 50,000 professional engineers. The work of the Government engineer has far-reaching effects on the health, welfare, standard of living and economy of the Nation.

Throughout these and many other fields of engineering, the efforts of Government engineers have combined with those of engineers in private firms and industry to make the Nation and the world a better place in which to live. I emphasize the term "combined." It is essential that the joint efforts of engineers in the Federal establishments and those in private practice be continued if we are to meet the needs and solve the problems of today and tomorrow.

We have about 2,000 professional engineers on the Bureau's staff. These are supported in the achievement of the primary engineering function by an additional 3,000 scientific and technical staff members. The professional engineers are engaged in all phases of water resource development—planning, design, construction administration, operation and maintenance, and research. Out of some 700 professional engineers—civil, mechanical, chemical, electrical, structural, architectural engineers and engineering geologists—located here in our principal design office, some 400 are registered to practice their qualified profession. We are proud of this showing. Even though engineers in the employ of the Federal Government are not required by law to register, it is indicative of the high dedication, qualifications and prestige of our engineering staff. Many of our top Reclamation Administrators are also engineers by profession and are registered.

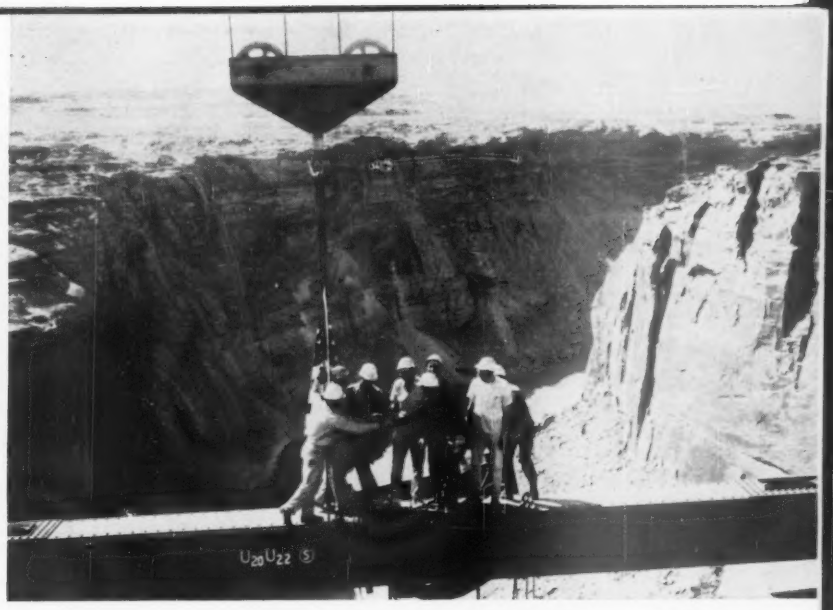
The use and retention by Federal agencies of engineering staffs have been criticized by engineers in private practice — including American Society of Civil Engineers—Consulting Engineers Council—and even the National Society of Professional Engineers. I have reviewed the recent survey report by your Society *"Role of Consulting Engineers in Federal Public Work Projects,"* particularly the conclusions and recommendations therein.

Your organization is to be commended for the constructive recommendations. I might add that the tone of the report and restraint shown is also to be commended.

Since the Bureau of Reclamation is specifically mentioned in this report, I believe it worthwhile to discuss here today the work of our engineers. I desire particularly to stress that such work is not di-

Hydraulic engineer William Wagner tests an air inlet on a model of the Flaming Gorge Dam on the Colorado River Storage Project. Coordination of a project on all levels facilitates the necessary constant tests for accuracy and perfection. This test will locate even the slightest leakage before it becomes serious.

Need ing Staffs



During the closing ceremony of the Colorado River Bridge, Project Manager Fran Murphy congratulates workers. Several such Bureau projects have been recognized for outstanding construction and beauty.

rectly comparable with the work of consulting engineers in private practice. I also hope to persuade the reader that performance of major engineering work by Government forces is necessary to accomplish the responsibilities placed upon the Bureau by Congress.

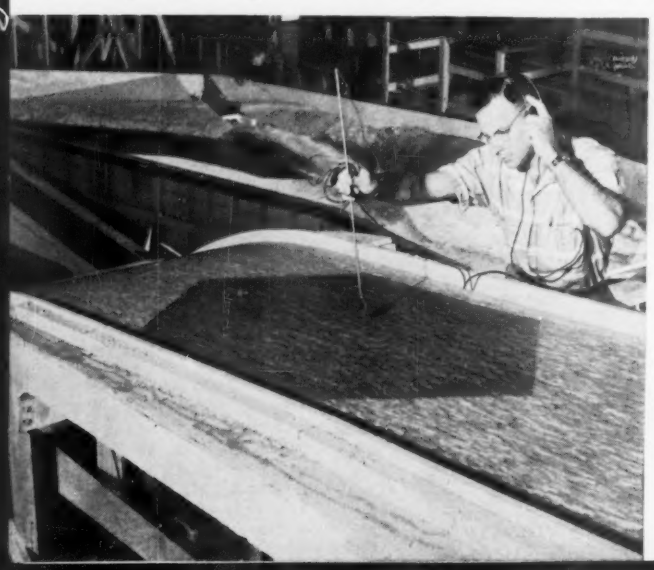
In reclamation work, a proposed project is suggested by potential water users who are generally farmers and ranchers. There is first considerable consulation at the local level. This requires the time of engineers and other staff members. This group may advance money to finance part of the cost of the investigation to measure the potentiality of the resources, and the economic value, of what would appear to be a potential reclamation project.

The Bureau forces then perform on-site coordinated investigation of the hydrologic, geologic and engineering feasibilities. Data accumulated in the form of maps, plans and analyses are further considered by argiculturists, economists, soil scientists and others having a variety of administrative talents. This is to determine economic feasibility and whether the prospective water users can, and would be willing, and are able to undertake repayment of the cost of the work to the Federal Government.

Joint effort of these teams culminates in a report for appraisal by local, state and Federal agencies, each of whom has a specific interest. The report is frequently supplemented and revised to satisfy the requirements of these local and state groups. Thereafter the report is further coordinated by the Bureau of the Budget, with other Federal projects and then submitted to Congress. If there is local support for the project and an indicated willingness to undertake the repayment obligation, the Congress may approve the project for construction.

The report from the beginning is subject to almost endless suggestions for revision and changes. These require day by day continuing attention by our engineers. Because of the complexity of various laws and interstate agreements that inevitably are involved in the authorization of a project, it takes personnel who have had continuous familiarity with such complexities to produce the end product.

The completion of this preliminary investigation stage is marked by Congressional approval of a project for construction. The Bureau then will establish a field office. Our field forces will acquire more detailed data for the preparation of final designs for the necessary structures and facilities to accomplish the project purpose within the terms of the Congressional authorization. Again we utilize the same team of construction engineers, survey crews, geologists, hydrologists and economists. Their



Hydraulic engineer William Simmons measures the velocity of a thin sheet of water moving over a model spillway of the Navajo Dam. In the background is a model of the Flaming Gorge tunnel spillway and outlet works.

Conditions in the testing labs duplicate as nearly as possible those on an actual project.

coordinated efforts bring to fruition the project plans.

Final designs are then prepared on these specific works and are incorporated in specifications along with the contractual requirements for construction. The specifications are issued to the public for bidding purposes, under established Government contracting procedures. These differ vastly from the procedures used in contracting for private work. Subsequent to groundbreaking, the onsite Bureau of Reclamation engineer than assumes additional

Working with a model of the Hungry Horse Dam, G. L. Beichley demonstrates one way in which Bureau engineers study projects to avoid difficulties before they develop into major problems.

duties. He must progressively inspect the work performed under a contract by a private contractor. He must administer the technical provisions of the contract. He must enforce the laws and regulations applicable to the contractors' employees with respect to proper wages and hours, safety, nondiscrimination, etc.

Should there be subsequent disputes or claims, his force assists in the documentation of the facts for consideration of the legal matters by our attorneys.

At this point, the Bureau then has its field forces, those that I have enumerated before, coordinating their efforts with our central design office in Denver. This coordination must also extend to the Washington level on matters of policy determination. There is a necessity for close liaison with the Department and Congress.

In our Denver office, we also have civil, mechanical, electrical, and structural engineers, soil scientists, geologists, economists and other specialists all of whom are acknowledged experts in their field. We also have a staff of specialists in our laboratories. They assist our designers in the solution of unusual problems, whether they relate to hydraulics phenomena or alkali reaction of aggregates. This group must work not only upon the problems of a specific project. They must work also upon Bureau and department-wide problems relating to the conservation and use of water. This latter field involves such far-flung subjects as study of earthquakes, corrosion resistance of pipe distribution systems, wind and ice loads to which our transmission lines are subjected, seepage problems, which we not only anticipate but must correct, and many other such problems. These must be solved in order to carry out our responsibilities satisfactorily.

Upon the completion of a project, our "construction stiffs" move on. Our operation and maintenance experts take over. Here again we must have qualified project engineers on the job in charge of the laborers and other subprofessional employees. These engineers must operate, must repair, must construct additions and occasionally change our structures to meet local conditions.

Their talents are not only extremely useful. They are absolutely necessary when we come to emergencies which may require the shutdown of a plant, emergency repairs, rerouting of electrical load and so on.

For example, consider the operation of a river basin system in which are located several dams and powerplants and the connecting systems of transmission lines, as well as irrigation systems. The routing of floods into the reservoirs, the release of water from certain reservoirs and the cumulative effect upon the operation of irrigation systems and powerplants is a very complex operation. It requires extreme coordination.

The coordination is between the staff of expert power men and hydrologists who study the flow of water, consider the water lost in transit, the evaporation effects, accumulation of sediment, and the flows necessary to satisfy water rights and other river regulation purposes. Coupled with this team are the operating engineers of the powerplants, pumping plants, and irrigation works. Those crewmen located in a central power dispatching office maintain continuity of power to the far-flung customers. Without a qualified staff of engineers and technicians constantly on the job, chaos would result.

Thus there is a continuity to the Bureau's engineering work which extends from conception of a reclamation project into the operation and maintenance of the completed work. The matter of coordinating the activities and findings of our engineers with other specialists and scientists is ever present. The value received from their work, as determined by observing the operating results, lies in the fact that we can use the experience of our past achievements, and progressively improve our techniques in the planning of future work.

Just as any project unit must be considered in terms of its effect on river basin development, so any work of any design unit must be considered in relationship to the over-all job. Design cannot be self contained or separated from project investigations, from research, from construction, nor from operations.

Conversely, all of our work overlaps and affects engineering design. Design of structures and facilities is progressive during the project investigations stage. It is developed and modified throughout the construction phase to take advantage of economies effected through research and technological advancement. It is adapted to fit changing subsurface and other conditions disclosed in the construction operations.

In carrying out the Bureau's program, we must call upon many and a variety of skills which include engineers, scientists, economists, agriculturalists, repayment contract negotiators, and management and administrative specialists, many of whom have acquired national and international reputa-

(Continued on page 46)

By
JAMES W. JACOBS, P. E.
Research Manager
Frigidaire Division
General Motors Corporation

PROFESSIONAL DEVELOPMENT OF ENGINEERS

a realistic view of the individuals who call themselves professionals

In recent years many articles have appeared in our profession's periodicals which have tried to psychoanalyze engineers, tried to formulate that which makes them tick, what differentiates them from other types of professional people, what they respond to, what they like and dislike—in short—to equate them with a mathematical formula.

This type of analysis sometimes seems to border on absurdity. Let us examine this clan of engineers as we really see them. To do so we should first divorce them from their professionalism, their degrees, their technical society associations, their papers, yes, even their slide rules or computers.

Someone has boldly hypothesized that today's engineer is really a human being in disguise, a human being with all the attributes and all of the frailties and shortcomings of other humans. Suppose we compare our engineering friends together.

Let us start on Sunday. In church you will find engineers sitting in your church choir singing songs of the glory of God in a strictly unprofessional manner. If you look a little further you will find others ushering people to their seats, taking up the collection or teaching Sunday School classes. On Sunday they also play golf in the morning, swim in the afternoon and picnic in the evening.

Monday nights you will find no small number taking those "Cha Cha" dancing lessons, bridge lessons, or putting the finishing touches on the new speed boat.

Tuesday nights they become Kiwanians, Rotarians, Lions, Jaycee's, or attend the PTA or the Church Board Meeting.

Wednesdays they attend the weekly Chamber of Commerce lunch, and Wednesday night participate in the Army or Navy Reserve Program.

Thursday nights they act as Cub Scout Den Dads, Scoutmasters, or attend political party meetings.

Friday nights they bowl in their leagues, collect funds in the neighborhood for the polio or community chest drive, or go to the basketball games.

Saturday nights, friends come over to play cards from pinochle to bridge to poker, or watch the late, late movies. They go to dances and they even go to night clubs.

From years of personal experience we know that today's engineer is gregarious, fun-loving, serious, religious, full of life, self-giving to his friends and to his community.

How can professionalism change this man? It can't and doesn't. Today's engineer is aware of all that is around him. His development is and must be on a much broader basis than his professional requirements alone. What, then, is a measure of an engineer's professional development? It has been suggested that it is all that he does on his job and for his community. It may be said that it is the intangibles which constitute professional development. In reality it is the unenforceable obligations of employment and citizenship which are the hallmarks of real professional development.

Now, let's examine our professionalism candidly. The engineering profession is using a state license to establish its professionalism. We know that any graduate engineer can pass the state exam by studying the problems available from previous exams, or by taking the refresher course offered by most colleges or universities. Once he has taken this exam and passed it, we attach the word "professional" to him and welcome him with open arms. Can this alone support the profession or can and should it also stand on the more sure foundation of its contributions throughout history to the well being of our fellow man?

We should be more interested in what engineers did, do or can do than in their college, their fraternity, their professional societies or their state license number. What they create will last forever because it is for others, and it is this creation for the well being of others which we should really honor.

How many people really know

of your engineering contributions to the welfare of others, your engineering department's or your company's contributions? Does the public really know where this tremendous surge in technical changes came from?

If we want to raise our professional standing we should put our accomplishments before the public—not in the form of highly involved technical presentations for our publications but in interesting, readable, seeable and listenable presentations to portray the challenges, the heartaches, the failures and the successes of our profession. History records the greatness of Whitney, Edison, and the Wrights, yet many of the problems we are solving today dwarf those of yesterday's greats.

In a recent talk to General Motors' stockholders John F. Gordon, president of the Ohio Society of Professional Engineers pointed out that "people make the difference" in the success or failure of any organization. We can paraphrase this statement in terms of engineering. People essentially are what make one company's engineering effort different from all others. The

Re-evaluation of employees at General Motors lets an engineer know where he stands with management.

others can establish equal engineering facilities. They can inform themselves as to similar techniques, processes or data. They can purchase the same materials, supplies and services. They can have access to the same market information. All of these things can be duplicated by any company's engineering department that makes the effort. But one thing that cannot be duplicated is people.

If a company's engineering effort prospers, it is primarily because of its engineers. It must have engineers who know how to design and develop and produce, engineers who know how to supervise their work, engineers who know how to merchandise and sell their ideas. Above all it must have engineers who know how to work together as an effective, dynamic team.

The French, as usual, have a phrase for it. They call it "esprit de corps." The hallmark of "esprit de corps" is that the group as a whole is greater than the sum of its parts. Engineering management must recognize that one of its most important tasks is to assure that we continue to have the kind of people who can and will make the whole greater than the sum of its parts. We must continue to develop "esprit de corps" among our engineers. We must continue to encourage our engineers by giving them credit for a job well done. We must stimulate our engineering personnel so that they are fully prepared to move up the executive ladder to positions of increasing authority and responsibility.

Perhaps we should try to establish what management has a right to expect of its young engineers. Obviously, we are first interested in their academic training. This training should not only be on the basis of providing a fundamental knowledge of engineering but also of how to use this knowledge. We expect our engineers not only to continue to keep up to date technically, but also to broaden their interests into the operation of our company, to learn more about all of our products and definitely to become acquainted with company policies and procedures.

Our engineers must be creative. Unfortunately this is not always a matter of education. It sometimes seems a most elusive quality to measure when we employ new engineers. Inventive genius is more often a very rare quality although it can be effectively cultivated by proper guidance and encouragement.

Our engineers must display self-starting and self-winding characteristics. The desire to get the job done is a quality more often appreciated than all others. It has been said that it is easier to bridle a race horse than it is to whip a mule into action.

If engineering management is doing its proper job, we should also expect and look for leadership characteristics in our young engineers. Leadership ranges from simply getting the job done through the co-ordination and co-operation of other people to potentially completely directing the entire engineering activities of a company.

Engineers must be enthusiastic and optimistic, willing to take failure and disappointment in stride, and to strike out again in a new direction to find the answers needed. Eagerness to put forth creative effort is a tremendous asset for any young man, but to follow it through is like manna from heaven.

Also the young engineer must have potential for future responsibility. Without this inherent potential his value will be only short-lived. He will not grow, but will stagnate along the road to engineering success.

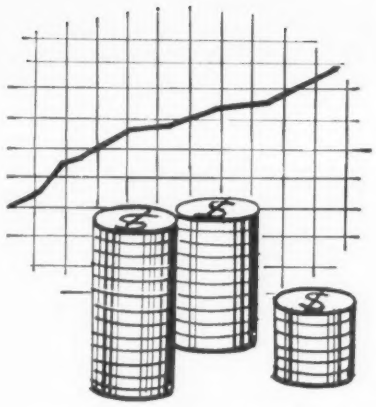
Someone said that engineers must not only be versed in the three R's of good engineering design—reasonable cost, ruggedness and reliability—but they must have four I's instead of two. These four I's are intelligence, inquisitiveness, ingenuity and initiative. Our engineering personnel must be intelligent—have minds which operate in an understanding way. We must have inquisitive minds groping for other than the accepted way—to look for the better way. We must have ingenious people who come up with solutions to the impossible. And the last of the four I's—initiative—we must have people with aggressiveness, drive and ambition.

Any company with this caliber of engineering people will achieve new goals and arrive at new engineering heights.

Now let's examine the area of management's responsibilities in the development of its engineers. Engineers value concrete monetary rewards highly, yet basically do not expect these tangible benefits unless they are based on performance. This is usually because an engineer has a strong sense of responsibility and a keen appreciation of achievement. How do we relate or equate salary to an engineer's development? If we define his development as job accomplishment we get a direct method of equating it. We reward periodically those engineers who demonstrate top notch performance and who demonstrate growth in potential value to the company. Those who display less performance and less potential will be rewarded less frequently and in lesser degree. Obviously, those who display little potential or low job performance are eventually encouraged, one way or another, to make a one-way trip out the front door.

Most of our engineers are career minded. Management's problem to keep them so is to provide a stimulating work atmosphere and job opportunity. We must provide advancement opportunities from the bottom of the organization upward. We must develop a feeling of pride in accomplishment. Every engineer should feel that his work is just about the most important work in the whole engineering department. We can help to do this by finding the right work assignment, showing the engineer how this assignment fits into the overall project, and providing variety of assignments within his capabilities. At the same time we must keep open the communication channel from management down with respect to requirements or changes in the project, and from the engineer upward with respect to the results, whether success or failure, of the project.

We must also let the engineer know how he stands in management's eyes. In General Motors we do this by an annual review of his progress in which he is rated from outstanding to unsatisfactory. He



A working profit sharing plan stimulates the engineer's interest in the company as well as in his own work.

is evaluated on individual traits of productivity, quality of work, cooperation, new ideas and plans, leadership and attendance. When he is interviewed by his supervisor the evaluation is discussed thoroughly with him and he may make his own written comments on the evaluation sheet. We are the first to admit that any form of employee evaluation report needs constant improvement—the perfect one has not yet been devised.

Another management responsibility is to provide adequate technical support, staff and facilities for engineers. We must not relate an engineer's professional development to the doing of what he may consider subprofessional work. We should relate his development to his rise to challenges, his interest and his ability to accept diversity in job assignments. No engineering job is always glamorous. Like any other job, it has its great amount of routine work. Many engineers try to delegate this routine work to semitechnical people. In delegating the work, however, the engineer cannot delegate his responsibility. He and he alone holds the responsibility for the development of a well engineered product. Technical support for engineers in a company such as ours may be of interest. In our product engineering groups for each engineer employer, we employ two model makers, one draftsman and .6 of a technician. For an average engineering section of five engineers this means that it is supported by 10 model makers, 5 draftsmen and 3 technicians.

Not only must we provide facilities, technical help and desirable work assignments, we in management must also provide competent supervision of the engineers. We must have well defined project objectives and yet be as wide in latitude as possible to allow the engineer to be self-directing. We must allow him to put his ideas to work so as to influence the technical decisions which affect his work. Perhaps we should call this the responsibility to start and to complete independently his job assignment.

Mentioned earlier was the "esprit de corps" that management must instill in its engineers and the rewards that come back to the company when it can establish this spirit in its men. These things do not just happen by themselves. There must be a sustained management effort based on definite programs to achieve this spirit. We know every engineer wants credit for his accomplishments and seeks job security based on them. He wants to share in the success of the company based in no small way on his contributions. In General Motors there are several outstanding programs which help to stimulate this engineering development. Let's look at several of these programs.

First, let us refer to our company's savings-stock purchase program. Under this plan engineers can pay in up to 10% of salary with the Corporation contributing an additional 50¢ for each dollar an engineer saves. Engineers' savings are invested half in government bonds and half in General Motors common stock while the Corporation's contribution is invested entirely in General Motors common stock. The employee's contribution and the Corporation's contribution are held by a trustee for a period of 5 years during which stock dividends are used to buy more stock and the bonds increase in value. After the 5 year holding period the stock and bonds are returned to the employee at an expected substantial increase in value. Almost 100% of eligible en-

(Continued on page 45)

New Literature

ZIMMERMAN PROCESS—Operation of the Zimmerman Process in the disposal of sewage sludge is described in a new brochure prepared and distributed by Sterling Drug, Inc., whose engineers discovered and developed the process. The brochure features on its cover an illustration of a 170-ton steel cylinder, 65-feet high, which is the heart of the process. Called a reactor, the cylinder is one of four installed at the West-Southwest Works of the Metropolitan Sanitary District of Greater Chicago. Besides a complete explanation of the process, the brochure also contains a model of the Zimmerman Process oxidation unit of Wheeling, W. Va., designed to meet the requirements of a population of 100,000.

(Circle 15 in Readers' Service Dept.)

IDLER-CONVEYOR—McNally Pittsburgh's brochure No. 660 gives complete information on the Cradle Idler and Belt Conveyor. This brochure gives a description, photographs, dimensional drawings and capacity tables of the McNally Cradle Idler, Idler H-frames and Belt Conveyor. Information is given on use of these belt conveyors for underground material handling. The pre-engineered conveyor sections are also described in this brochure.

(Circle 16 in Readers' Service Dept.)

LIGHTING—Kerrigan Iron Works Company has now published two catalogs on lighting standard equipment. One features octagonal tapered steel and aluminum and the other, aluminum round tapered. Each offers the new designs in both street and area lighting standard equipment with a variety of arms to meet most any lighting problem. Traffic signal standards, brackets and mast arms for wood, metal pole, and wall mounting are also included in the round aluminum catalog.

(Circle 17 in Readers' Service Dept.)

GEARS—PIC Design Corp. has announced publication of a new 24-page catalog, covering their new line of Precision Spiroid Gears. The new catalog contains complete specifications, detailed drawings and prices on

these unique design, high performance worms and gears. Manufactured under an exclusive license agreement with the Spiroid Division of Illinois Tool Works, the new Spiroid gears are available for immediate delivery. The use of Spiroid worms and gears offers the designer of small-package assemblies the added advantages of extreme accuracy, positive backlash control, great shock strength and low noise level in all high ratio, right angle gearing applications.

(Circle 18 in Readers' Service Dept.)

SOUND CONTROL—Elof Hansson, Inc., Acoustical Division, has just issued its new 20-page catalog 61 which contains a complete listing of sound absorptive, sound isolating and special purpose acoustical materials. The catalog contains pictorial presentation of all products coupled with general and technical descriptions including sound absorption, sound transmission loss and other functional data. The products are coupled in accordance with their combustibility rating and method of application. There is also a listing of special purpose acoustical products for unusual purposes in both commercial and industrial construction.

(Circle 19 in Readers' Service Dept.)

CEMENT ADDITIVES—Placewel and Retardwel, two liquid admixtures for concrete, are described in a new folder published by Johns-Mansville. The 4-page brochure completely describes the advantages of the two materials, Placewel for water-reduction and Retardwel for control of setting and water reduction. Data are supported by charts and tables resulting from test findings. Advantages of Placewel include reduction of water without reduction of strength, increased durability and workability, and decreased shrinkage, and permeability. Advantages described for Retardwel in warm weather operations include reduction of water requirements and shrinkage and increased durability and 28-day compressive strength.

(Circle 20 in Readers' Service Dept.)

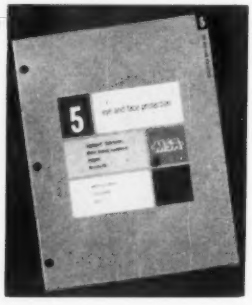
SURVEYING INSTRUMENTS—Latest edition of the handy, 192-page, combination astronomical and surveying instrument manual is available from Keuffel & Esser. Packed with diagrams, charts, schematic drawings and illustrations, the "1960 Solar Ephemeris and Surveying Instrument Manual" is pocket-sized for easy carrying and quick reference. The booklet is divided equally into sections covering surveying instruments, their use, and the Solar Ephemeris. In presenting full details and operational procedures for all basic surveying instruments, the booklet also covers their use, care, maintenance, disassembly and adjustments. Contained in the Solar Ephemeris section are mathematical and astronomical tables, including the Solar Ephemeris and GHA Polaris; units of measurement; illustrated applications of mathematical formulae; instructions for setting magnetic declination, taking stadia measurements and applying the three-wire leveling method. Also presented are the principles and practices of celestial observations.

(Circle 21 in Readers' Service Dept.)

PRODUCT GUIDE—This handy, fact-packed guide to the most frequently ordered products of the Superior Electric Company is small enough to fit easily into a desk file or three-ring binder. Covers ratings and other essential technical data of powerstat variable transformers, stabiline automatic voltage regulators, supercon electrical connectors, superior 5-way binding posts, dub-l-plug dual electrical connectors, slo-syn synchronous motors, flexiformer packaged transformer primaries, powerstat decade line correctors, exel loading reactors, and varicell adjustable A-C/D-C power supplies.

(Circle 22 in Readers' Service Dept.)

FACE PROTECTION—A completely new selection of eye and face protection for a wide variety of industrial applications is described in a brochure



available from Mine Safety Appliances Company. Highlighted in the 40-page catalog is the Sightgard line of eyewear which combines maximum protection with the distinctive appearance of modern functional spectacles. This eye protection meets individual needs and preferences through a variety of frames, temple styles, bridges, and lenses. Also reviewed in the catalog are vision testing equipment, goggles, faceshields, welding helmets, accessories and parts.

(Circle 23 in Readers' Service Dept.)

GRATINGS—A new 16-page catalog issued by Borden Metal Products Company gives emphasis to the three basic grating types used in construction. Includes dimensional drawings of more than thirty grating subtypes; 8 safe-load tables for steel grating, aluminum grating, roadway grating and sidewalk slabs, plus other tables for panel widths, tread widths, floor armor, etc. Various safety treads and nosings are also shown in the catalog as well as detailed instructions for selecting, specifying and ordering grating.

(Circle 24 in Readers' Service Dept.)

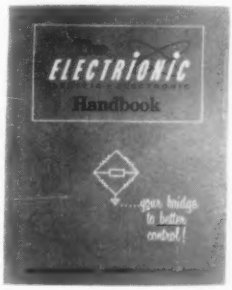
TECHNOLOGY ENCYCLOPEDIA—A multi-volume compendium of today's scientific and technological knowledge titled, "The McGraw-Hill Encyclopedia of Science and Technology," has just been published. The work, which has taken five years to complete, is in 15 volumes, containing more than six million words and approximately ten thousand illustrations. It consists of 7,200 authoritative articles written by more than two thousand contributors under the supervision of 63 prominent consulting editors. It covers all fields of life—science, physical science, earth science, and engineering, and also includes the major applications of these fields in other technologies. The work is thoroughly cross-referenced, contains extensive bibliographies, and has an index of more than 100,000 entries.

(Circle 25 in Readers' Service Dept.)

TECHNICAL WRITING—Now being offered from the American Industrial Writing Institute is a pamphlet entitled "Better Writing," which is aimed at authors of technical books and papers. The pamphlet contains suggestions for making technical writing more readable, as well as a selected bibliography of reference books on good writing. Published bi-monthly by the Institute, it will deal with a variety of technical fields.

(Circle 26 in Readers' Service Dept.)

ELECTRIONIC HANDBOOK—Barber-Colman has recently released a new handbook entitled "The Electrionic Handbook," which covers the ap-



plication of electric and electronic controls in commerical and industrial air conditioning installations. The handbook explains in detail the theory of electric and electronic control, makes comparisons between electronic and pneumatic controls, and is completely illustrated with photographs and diagrams. The handbook will be of interest to architects, engineers, contractors, and users of automatic controls. Revealed are the many advantages to be gained through the application of electronic control equipment.

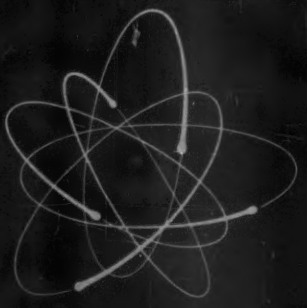
(Circle 27 in Readers' Service Dept.)

HOODING SYSTEMS—"In A Fog About Electric Furnace Fume?" is the title of a new bulletin offered by Wheelabrator Corporation which discusses the three accepted hooding methods for controlling fume from electric arc melting furnaces—the furnace roof type, overhead canopy hooding, and direct shell evacuation. Described in detail in this 8-page bulletin are the operating principles and advantages of each system to serve as a guide in evaluating each hooding method for a particular furnace fume control application. Illustrations of typical installations and diagrams are included to show the features and uses.

(Circle 28 in Readers' Service Dept.)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in these columns, merely circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

PROMOTIONAL AIDS FOR



NATIONAL ENGINEERS' WEEK

HERE are the basic promotional aids on which to build your Engineers' Week program. These items will give your program coverage in local newspapers, on radio and TV stations, and in civic and group displays. Use these promotional materials to emphasize the career opportunities in engineering.

1 ***TV Spot Films:*** A set of seven 20-second TV films dramatizing the theme of the 1961 National Engineers' Week. Produced to meet network standards, the films call attention to the career "doors" which are opened with an education in engineering and the physical sciences. Each film qualified for public service TV time during station breaks. A set of these seven films will reach your largest Engineers' Week audience. Price: Set of seven films, $25.

2 ***Set of Seven TV Slides:*** Obtain extensive TV coverage through the Week with these slides displaying poster-type art work and printed copy calling attention to engineering. May be used during all TV station breaks as public service announcements. Price: $10 per set of seven slides.

3 ***Tape Recorded Radio Announcements:*** A set of seven 20-second radio spot announcements, made by a network radio and TV announcer. Offers local stations a top-level recording for 20-second station breaks. Price: Set of seven recorded announcements, $3.50.

4 ***Lapel Buttons:*** A high-quality lapel badge with poster design. Each chapter or state society can set its own price for button sales. Prices: 100 to 500—15c each; 500 to 1,000—10c; 1,000 to 3,000—7c; 3,000 to 5,000—5c; and over 5,000—4c.

5 ***Posters:*** Colorful 9 x 11-inch pasteboard posters carrying the 1961 Engineers' Week design and theme. This is the basic promotional item for calling attention to the Week. Use on bulletin boards, in window displays, school exhibits, etc. Large size (18 x 22 inches) also available. Prices: 9 x 11, $4 per 100; 18 x 22, $5 per 100.

6 ***Paper Banners:*** Excellent for display use. Three feet long by 6 inches wide. Has poster design and words "National Engineers' Week" in color. Price: $4 per 100.

7 ***Bumper Stickers:*** Gummed paper stickers, 15 x 3¾-inch, carrying the words National Engineers' Week and a reproduction of the professional engineer's seal, in bright orange on a black background. Prices: 100 to 500—15c each; 500 to 1,000—10c; 1,000 to 3,000—7c; 3,000 to to 5,000—5c; and over 5,000—4c.

8 ***National Engineers' Week Seals:*** Use these brightly colored seals on all office mail from now through February 25. Poster design printed on 1½-inch gummed paper. Price: $3 per 1,000.

9 ***Newspaper mat story on the educational background needed for a career in engineering:*** A feature article stressing the importance of a well-ordered sequence of basic math courses throughout the four years of high school. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75c each.

10 ***Newspaper mat story on the engineer in private practice:*** A feature article explaining what a consulting engineer does, what kind of background he needs, and how he must be registered as a professional engineer to sign plans and specifications. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75c each.

11 ***Newspaper mat story on the engineer in industry:*** A feature article describing how engineers in industry utilize their professional knowledge and skill in research, development, and production. Prepared on mat, with illustration, ready for immediate insertion in daily or weekly newspaper. Price: 75c each.

12 ***Logotype:*** A metal cut of a poster design to insert in advertising, special sections of newspapers, industrial house organs, magazines, and other printed matter. All state society and chapter publications should have one. Price: $1 each.

13 ***"Engineering's Great Challenge . . . The 1960's:"*** A re-issue of the 15-minute tape recorded radio program distributed last year. Excellent for use on public service radio time. Price: $3 each.

USE THIS COUPON TO ORDER YOUR AIDS NOW!

1. ———TV spot films @ $25 per set.
2. ———TV slides: set of 7 slides @ $10 per set.
3. ———Recorded spot announcement @ $3.50 per set.
4. ———Lapel buttons: 100-500 @ 15c ea.; 500-1,000 @ 10c ea.; 1,000-3,000 @ 7c ea.; 3,000-5,000 @ 5c ea.; over 5,000 @ 4c ea.
5. ———Posters: regular size @ $4 per 100.
   ———Posters: large size @ $5 per 100.
6. ———Banners @ $4 per 100.
7. ———Bumper stickers: 100-500 @ 15c ea.; 500-1,000 @ 10c ea.; 1,000-3,000 @ 7c ea.; 3,000-5,000 @ 5c ea.; over 5,000 @ 4c ea.
8. ———Seals @ $3 per 1,000.
9. ———Newspaper mat stories on educational background for engineering @ 75c ea.
10. ———Newspaper mat stories on the engineer in private practice @ 75c ea.
11. ———Newspaper mat stories on the engineer in industry @ 75c ea.
12. ———Logotypes @ $1 ea.
13. ———Radio tapes: "Engineering's Great Challenge . . . The 1960's" @ $3 ea.

National Society of Professional Engineers
2029 K Street, N.W./Washington 6, D.C.

Sirs:
Please rush me items indicated. I enclose a check ☐ money order ☐ in the amount of $ _____
I understand remittance must accompany order.

NAME _____
(Please Print)

ADDRESS _____

CITY _____ STATE _____

Engineers' Week Plans Commence Final Stages

A total of 14 items are available for use on public service television time during the 1961 National Engineers' Week, February 19-25. The total includes seven slides and seven 16mm spot films.

The metal-mounted, glass slides, illustrated on this page, are available from the National Society headquarters for $10 per set of seven. The 20-second spot films, made in 35mm and narrated by Ben Grauer, may be ordered from the National Society for $25 per set of seven. The films call attention to the contributions of engineers and the opportunities in engineering for young people in the years ahead.

Both the films and the slides emphasize the theme of the 1961 Engineers' Week observance —"Engineering . . . A Career of Opportunity."

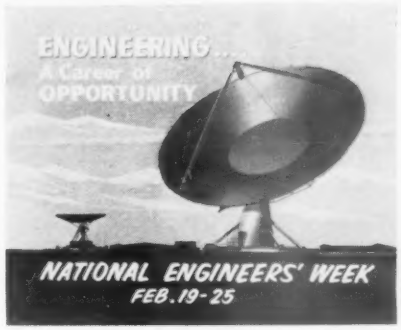
Planning for the 1960 observance went into the final stages this month in many local chapters and state societies. Career conferences for high school seniors are being organized, and many chapters are scheduling guided tours of local industrial plants and research labs, TV panel discussions, essay contests on engineering, and film showings for school and other community groups.

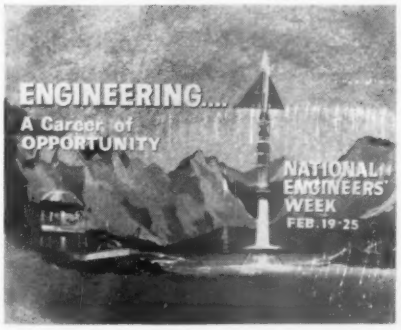
Special newspaper sections on engineering will once again be a feature of the Week. Sample newspaper sections obtained for the 1960 Engineers' Week are available, at no charge, from the National Society.

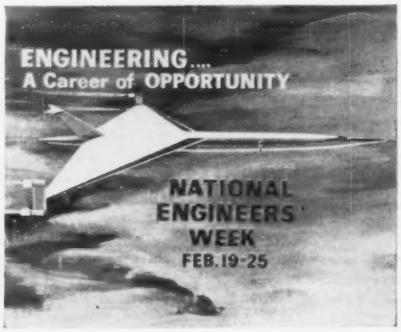
A limited number of promotional kits may still be ordered from the National Society. The kits contain samples of posters, banners, lapel buttons, bumper stickers, and gummed seals, along with suggestions for developing a basic Engineers' Week program at the chapter level.

The 1961 National Engineers' Week will be the 11th under the general sponsorship of NSPE. Fourteen leading engineering figures from industry, education, government, and private practice will serve as individual sponsors for the observance. National chairman for the 1961 Week is Warren G. Stadden, a consulting engineer and architect of Roselle, N.J.

Efforts will be made to have a joint resolution introduced in the Senate designating the week of George Washington's birthday each year as National Engineers' Week. The newly elected President of the United States will also be asked for a communication to the engineering profession on the occasion of the 1961 Engineers' Week observance. Reproductions of the President's message, when available, may be ordered from the National Society. Such reproductions may be used for mailings to industry, engineering schools, government agencies, newspapers, magazines, and industrial house organs.







Alabama SPE Board Meets in Huntsville

The Board of Directors of the Alabama SPE recently held its fall meeting in Huntsville.

E. M. Titus, president of the Tennessee SPE, Don Schnake, secretary-manager, Kansas Society, Engineers in Private Practice, and George S. Rawlings, P.E., Charlotte, N.C., Southeastern Vice Chairman, NSPE Functional Sections Committee, NSPE, contributed vitally important features to the meeting, and as the result of their efforts there is the very definite indication that Alabama soon will have Functional Sections on Engineers in Government, and Consulting Engineers in Private Practice. Special meetings studied out details with the visiting officials, and took the necessary steps at the closing session of the Board's open meeting October 1.

The Board decided that the 1961 Annual Meeting of the Society shall be held May 26 and 27. It also was decided that the Board will meet again in February in Auburn, and that the members will be available for a prior meeting before the end of this year if found necessary. The Executive Committee will meet to dispose of several items referred to it with power to act, probably within thirty days.

Henry R. Hudson, P.E., of Montgomery, president of the Ala. SPE, directed the various sessions of the program, and delivered a special address at a dinner of Engineers in the fine dining hall of the famous Chemstrand Corporation located at Decatur, a short distance from Huntsville.

A report by the Committee on Legislation, T. M. Francis, P.E., Birmingham, chairman, concerned a complete new registration law which has been drafted after much study. Copies of the proposed new law will be distributed, by order of the Board, and it is expected that it will be introduced at the next session of the Alabama Legislature.

A report by Leonard S. Woody, P.E., Birmingham, former president who was appointed last Spring to head a study of a proposed Handbook for Alabama SPE officers and committees, revealed that the work had progressed and that a concise draft of duties had been prepared for the officers, and executive secretary, and some of the more important committees. It was indicated that the work on the proposed manual will continue.

The agenda for this meeting was very exhaustive, and every opportunity was given for the expression of opinion and presentation of recommendations. Many of those present took advantage of the opportunity.

NSPE Names Strong Field Representative

NSPE Executive Director Paul Robbins has announced the appointment of Colonel J. D. Strong, USA, Ret., to the National Society headquarters staff as field representative.

The originator of the Army's professional engineer preparatory course for qualified personnel of the Armed Services who desire to obtain registration, Colonel Strong retired from service in the U.S. Army Corps of Engineers last year.

Col. Strong

The newly appointed field representative will assist state societies and local chapters in an expanded program of orientation and information concerning the National Society's objectives and activities. In the past five years, fourteen state societies have affiliated with NSPE, and approximately one hundred chapters either have been formed or have been added to the rolls. With the continuous turnover of leadership at the local and state level, it has been felt that there is need for a more extensive orientation and information program in order for the Society to be truly effective in implementing its philosophy of a grass-roots organization.

The effectiveness of these programs is in almost direct proportion to the extent to which the opportunities are understood and the programs implemented at these levels. Colonel Strong will endeavor to develop procedures whereby a better dissemination and understand-

Public Works Award

Roy W. Morse, center, receives the American Public Works Association Plaque as one of the top ten public works men of the year at a meeting of the Seattle Kiwanis Club recently. Morse, a member of the Seattle Chapter of the Washington SPE, received his civil engineering degree from the University of Washington, and has been active in public works since. Stephen S. Selak, left, president of the Kiwanis, and Mayor Gordon Clinton of Seattle made the award.

Left—D. G. Jentsch (l.), president of the Victoria Chapter, TSPE, welcomes Thomas Mann, vice president from the Southwestern Area, and Kenneth M. Smith (r.), TSPE president-elect, to the first TSPE Area Conference which was held recently to bridge the gap in communications between state level officers and chairmen and members who do not attend Board and Annual Meetings.

Right—The Louisiana Engineering Society State Fair booth was based on the 1961 Engineers' Week theme, "Engineering . . . A Career of Opportunity." Available at the booth were copies of NSPE pubications, applications for registration and Society membership blanks. Shown are M. C. Bubenzer (l.) and Francis W. Grant.

ing of the Society's programs will be available not only to states and chapters, but to individual members.

A native of Minnesota, Colonel Strong received his B.S. in civil engineering from Yale University and is a graduate of the Army's Engineer School and the Command and General Staff College. He is registered as a professional engineer in the District of Columbia, and holds membership in the Society of American Military Engineers, and the American Society for Engineering Education. He is also a Fellow of the American Society of Civil Engineers, and is a member of the Engineering Manpower Commission of the Engineers Joint Council.

Alfred H. Lovell

Alfred H. Lovell, professor emeritus of electrical engineering at the University of Michigan, died recently at the age of 76 in Ann Arbor, Mich., following a brief illness. Besides being an active member of NSPE, he had also held offices in AIEE and the Engineering Society of Detroit.

Noah Hull Speaks to Texas Engineers

NSPE President Noah E. Hull will be the keynote speaker at the forthcoming annual convention of the Texas Society of Professional Engineers. The meeting will be held at the Windsor Hotel, Abilene from January 19 to 21. Southwest Area Regional NSPE Vice President Thomas T. Mann also plans to attend the affair.

At a recent meeting of Abilene Chapter and State officials, final plans for the yearly sessions were formulated. Major issues will be various conferences, keynote and luncheon speeches, committee chairmen's reports, awards and citations, and installation of new officers. Much preparation has been made by the Abilene Chapter Auxiliary to entertain the wives and for the social hours.

Prominent authorities from the fields of higher education and missile development are being secured as luncheon speakers. A hearty West Texas welcome is extended by the Abilene Chapter to all NSPE-TSPE members who at the present time do not live in Texas.

Morris County Visits Local Paper Company

Twenty-two members of the Morris County Association of Professional Engineers and Land Surveyors visited the engineering and production facilities of the International Paper Company, Container Division, at Whippany, N.J.

Mr. Burritt Hinman, personnel director, described the plant and its operation, and presented a film showing the manufacture of paper. In the guided tour, the engineers saw a complete corrugated-container converting plant fabricating a variety of products.

Following this interesting visitation the engineers held their regular meeting at the plant's cafeteria.

Harold Turner

Harold Turner, executive vice president of the American Electric Power Service Corporation, died recently in Bronxville, N.Y., at the age of 58. He was active in both the Ohio and New York Societies.

1961-62 Nominees Are Announced

STEPPING from a record of excellent service on the state level, Murray A. Wilson of Salina, Kansas, has been nominated to lead the National Society during 1961-62. The Nominating Committee made the announcement in a memo to state presidents during November.

Murray A. Wilson

The presidential nominee has since 1959 been the executive director of Wilson & Company, Engineers and Architects, his own company. He has been in private practice since 1932 when he first became a partner in the Paulette & Wilson engineering firm. Prior to that he had been with the Kansas Forestry, Fish & Game Commission, the Bureau of Public Roads, and a City Engineer in Hays, Kansas.

His outstanding accomplishments in professional activities have reaped for him a number of outstanding awards, among them the NSPE award for Outstanding and Unselfish Service to the Society and his Fellow Engineers in 1951. His most recent award came from Kansas State College for distinguished service in his field in 1957.

President of the Kansas SPE in 1948, Wilson also served on the Kansas State Board of Engineering Examiners from 1947 to 1958. As a member and later as chairman of the NSPE Board of Ethical Review (1954-1960) he has also been active on the national level. Besides his work in the Society, he is a member of the American Water Works Association, American Public Works Association, American Road Builders Association, and the Chamber of Commerce in Salina.

Other nominees included W. Earl Christian, vice president for the Northeastern Area; Harvey F. Pierce, Southeastern Area; C. R. Hanes, Central Area; Waldo Wegner, North Central Area; Thomas T. Mann, Southwest Area; and John H. Stufflebean, Western Area. Nominated again for treasurer was Russell B. Allen of Silver Spring, Md.

Additional nominees may be made by members, according to the constitution of NSPE. The proper procedure for making additional nominations, which may include any member of the Nominating Committee, is by petition signed by at least fifty persons. Any petitions must be received by the Washington office at least one week before the ballot is printed.

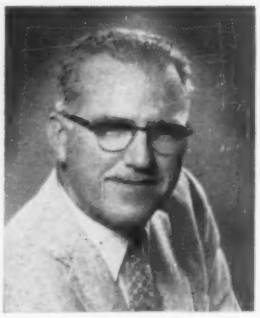
Members of the Nominating Committee were: Clark A. Dunn, Stillwater, Okla., chairman; C. V. Bonhag, Glen Rock, N. J.; Marcus Durlach, Jr., Columbia, S. C.; C. C. Hallvik, Boise, Ida.; W. L. Hindermann, St. Paul Minn.; and Alfred H. Samborn, Toledo, O.

W. Earl Christian

W. EARL CHRISTIAN, of New Brunswick, New Jersey, vice presidential nominee for the Northeastern Area for a second term, is chief engineer for the Hefler-Snyder Company, of Garwood, New Jersey. He studied in the College of Engineering, University of Illinois, 1916 to 1918, and served with the Corps of Engineers in World War I. He spent about thirteen years with the New Jersey State Highway Department.

During the past twenty-five years, he has been engaged in the contracting and construction field.

Mr. Christian is a past president of the Raritan Valley Society of Professional Engineers, and is a past president of the New Jersey SPE. He has served the National Society as a member of the Policy Review Committee, the Constitution and Bylaws Committee (three years as chairman), and is presently chairman of the Budget Committee.



Harvey F. Pierce

HARVEY F. PIERCE, of Miami, Florida, vice presidential nominee for the Southeastern Area, is a member of the firm of Maurice H. Connell & Associates, Inc., consulting engineers and partner in Connell, Pierce, Garland and Friedman, architects and engineers. He received his B.S. degree in electrical engineering from the University of Florida in 1932. After five years with the Florida Power and Light Company he joined his present firm in 1937.

From 1956 to 1960 he served as national director from Florida, and on the National Society of Professional Engineers Membership Committee, where he is currently serving as chairman.

He is a member of AIEE, SAME, AOA and ARS, is registered in Florida, Georgia, Alabama, Mississippi, North Carolina, South Carolina and Colorado, and holds a NCSBEE certificate.

Waldo W. Wegner

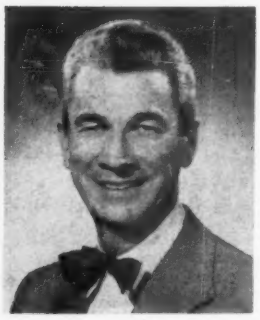
WALDO W. WEGNER, of Cedar Rapids, Iowa, vice presidential nominee for the North Central Area, is a civil engineer for Loomis Brothers, General Building Contractors in Cedar Rapids. He received his B.S. in civil engineering from Iowa State University, Ames, Iowa, in 1935 and continued doing graduate work at the University of Chicago while serving a public works apprenticeship with the American Public Works Association. He has served as city engineer for Cedar Falls and Mason City, Iowa. Following a term with the Civil Engineer Corps, USN, and one as city manager of Chariton, Iowa, he joined the Portland Cement Association until 1956 when he accepted his present position. He has served as president of the Cedar Rapids Engineers Club and the Iowa Engineering Society. Presently he is a National Director from Iowa, and chairman of the Young Engineers Committee. Among his non-professional activities are: president of Cedar Rapids Rotary Club, chairman of the Board of Appeals to City Building Code, member City Planning Commission, and member of the Iowa State University Alumni Association executive committee.

Thomas T. Mann

THOMAS T. MANN, of Roswell, New Mexico, vice presidential nominee from the Southwestern Area, heads the Mann Engineering Company in Roswell. Born in 1908, he received a Bachelor of Science degree in civil engineering from the New Mexico College of Agriculture and Mechanic Arts in 1929. After graduation he was employed by a New Mexico consulting firm for three years, and then joined the New Mexico State Highway Department. He remained in the latter post until 1941 when he started service with the United States Corps of Engineers.

Following four years in the Corps, he became superintendent of construction for New Mexico Highway Contractors. He served for two years as city engineer for the City of Roswell before establishing the Mann Engineering Company in 1950.

Mr. Mann has served as president of both the Southeastern Chapter and the New Mexico SPE, and is currently a vice president of NSPE. He is also chairman of the Society's Membership Committee and serves on the Engineering Practices Committee.



C. Ramond Hanes

C. RAMOND HANES of Columbus, Ohio, vice presidential nominee for the Central Area, is first assistant engineer of construction of the Ohio State Highway Department. He received his civil engineering degree at Ohio State University in 1924. He joined the Highway Department in 1928 after a brief period in industry and private practice. He is recipient of the 25 year Meritorious Service Award of the American Association of State Highway Officials.

He is past president of the Ohio Society of Professional Engineers, and was the first president of the Maumee Valley Society of Professional Engineers, a chapter of OSPE. He is a member of Theta Tau fraternity and is now serving as a member of the Executive Council as Grand Inner Guard. He is a member of Tau Beta Pi.

He is chairman of the Functional Section Services Committee and is serving his fifth year as member of the NSPE Board of Directors.

John H. Stufflebean

JOHN H. STUFFLEBEAN, of Tucson, Arizona, vice presidential nominee for the Western Area, is chief engineer for Blanton & Cole, Architect-Engineers. Born at Brookfield, Missouri, in 1918, he received his Bachelor of Science degree in civil engineering from the University of Missouri in 1945. He started his professional career with the Missouri Highway Department in 1940, joining the C.B. & Q.R.R. at Galesburg, Illinois, in 1941.

Following duty with the Field Artillery and U.S. Corps of Engineers as a lieutenant during World War II and his return to complete requirements for his degree in 1945, he moved to Arizona with the the Presbyterian Church.

Charter president of the Southern Chapter in 1949, he has served as secretary-treasurer and president of the Arizona SPE, as well as being a national director of NSPE. Other activities include ASCE, AWWA, SPGF, ASTM, Kiwanis, Elks, Masonic orders and the Presbyterian Church.

Mr. Stufflebean is registered in Arizona, Missouri, Texas, New Mexico and Nevada.

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By Mrs. Clark A. Dunn, Chairman, Ladies Auxiliary Advisory Committee.

Many ladies were present at the NSPE Board meeting in Denver in October and as usual had a wonderful time. While there was no auxiliary meeting scheduled during this convention, there was a great deal of "shop" talk among the ladies. New chapters are being organized all the time and there is much interest and curiosity among groups wanting to learn about the possibility of organizing in their locality.

From all sections of the country comes news of auxiliary activities. The Erie, Pennsylvania Chapter, Wives of Professional Engineers held their first fall meeting in the form of a "get acquainted social" in the home of one of the members. The speaker of the evening was Mrs. Hugh Nelson, a member of the Erie Chapter and president of the State Council of Auxiliaries.

The Shreveport Chapter of the Louisiana Engineering Society Auxiliary held a benefit bridge on October 25th with the proceeds going for two scholarships. This is their annual project. Also, they have contributed $25 to an engineering booth at the Louisiana State Fair.

Bucks County of Pennsylvania Auxiliary helped the men's chapter compile their yearbook. The men very graciously gave the auxiliary space to list the membership of the auxiliary.

Bronx County Chapter, New York, are at present making plans for their annual dinner dance to be held in November at Mayes Parkway Restaurant.

Especially interesting is the article in the October issue of the leaflet *The Professional Engineer* published by the Dallas Chapter, Texas Society of Professional Engineers. It is a brief history of the Women's Auxiliary to the Dallas Chapter from its beginning in 1951. There were only 12 auxiliaries in all of NSPE at that time and four of them were in Texas. Since then the activities have increased and the membership has grown, always with the purpose of assisting the engineer husbands in their activities.

Also in this issue is a salute to Mrs. Frank Chappell, outstanding teacher and club woman of Dallas who is an active member of the Dallas Chapter Auxiliary. She served as its president in 1956-57 and also served one term as chairman of the National Ladies Auxiliary Advisory Committee. She is credited with writing the first history of that group.

These articles make such interesting reading. I wish more auxiliaries would record the history of their organizations. That is a project some future national chairman may well undertake.

Winter Professional Meeting

NSPE will hold its winter professional meeting in Des Moines, Iowa, February 9-11, 1961, at the Fort Des Moines Hotel. The meeting of the Iowa Engineering Society, which will be held concurrently with the professional meeting will conclude in a joint banquet with NSPE Dean Curtis Wilson of the Missouri School of Mines and Metallurgy will speak at the banquet Thursday evening on, "The Strength of a Nation." Regional luncheons will be held Friday with a second banquet Friday evening. The meeting will conclude with a general luncheon on Saturday. Chairman of the meeting is James Foster (below), of the Pittsburgh-Des Moines Steel Co. Shown left is a view of downtown Des Moines.

NOMINEES

(Continued from page 43)

RUSSELL B. ALLEN, of College Park, Maryland, nominated for a fourteenth term as treasurer, is assistant dean of engineering at the University of Maryland. A professor of

Russell B. Allen

civil engineering, he has also served as head of that department, and acted as coordinator for the design, construction, and equipment of the new buildings of the Glenn L. Martin Institute of Technology of which the engineering college is a part.

A native of New Haven, Connecticut, he received his B.S. degree at Yale where he served for five years as an instructor in civil engineering while taking graduate work in structural engineering and architecture. He spent several years as a construction engineer with the Boston and Maine Railroad and was also engaged in private practice before going to Maryland in 1933.

He was instrumental in getting an engineering registration law passed in Maryland and was a founder of the Maryland SPE, serving as its first secretary-treasurer, its second president, and several terms as national director.

JACOBS

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gineering employees participate in this program.

Certainly most important from the standpoint of the career engineer is the General Motors incentive program. This consists of the Bonus Plan for which a substantial number of engineers is eligible, and the Stock Option Plan for top level General Motors executives.

The fundamental purpose of these plans is obviously to provide financial incentive and these programs are responsible for the fact that so many of our engineers are career engineers. It is also this program, with its incentives and rewards made proportional to contributions, which has caused our engineers to give to their jobs that something extra that is so necessary to success.

We in General Motors have a number of sources of engineering strength which are worthwhile to summarize. It is our continued concern to bring promising young people with leadership potential into our engineering organization. Each year we in General Motors interview hundreds of college seniors from schools all over the United States. At General Motors Institute in Flint, Michigan, we have almost 2000 student engineers from the United States, Canada and overseas studying for degrees in engineering. About 400 of these engineering students graduate annually from this program. Our General Motors Scholarship Program, begun in 1955, today provides annual subsistence, tuition and books for more than 1600 young people, plus supplemental grants to a large number of colleges and universities. This year 400 of these students will graduate. The General Motors Scholarship Program and the General Motors Institute Program represent an annual investment of $5,000,000. We feel that these programs are making a real contribution to the general area of engineering development from a management viewpoint.

It is equally important for those who have graduated from colleges to move ahead in line with their potential engineering capabilities. General Motors has recently instituted a General Motors Fellowship Program in which exceptional engineering employees are urged to continue their education at advanced levels. In this Fellowship Program a money grant is made to the college or university. Books and tuition are provided for the student employee and an annual subsistence fee is paid him while attending the college or university.

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We also have a College Tuition Refund Plan in operation with many Frigidaire engineering employees participating. In this plan our engineers attend local universities or colleges on their own time for undergraduate work. When they complete and successfully pass the course their tuition is refunded to them. Quite a few of our engineers are also working under this plan for advanced degrees through an extension school of the University of Cincinnati on their own time.

Albert Schweitzer put into words the challenge management has in helping in the development of its engineers. He said, "I always think we live, spiritually, by what others have given us in the significant hours of our lives . . . as a rule there are in everyone all sorts of good ideas, ready like tinder. But much of this tinder catches fire . . . only when it meets with some flame or spark . . . from some other person. Thus we have, each of us, cause

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Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.

NSPE Executive Director

Professional Pride

IT has been observed that engineers are sometimes reluctant to identify themselves as a member of the engineering profession. Too often there appears to be a tendency for the engineer to associate himself with his firm, his civic association, his service club, and possibly, if pressed, will admit somewhat hesitantly that he is also an engineer.

A NUMBER of reasons are expressed as to why engineers do not readily identify themselves with the profession. Among these is the idea that more status accrues to the individual from identification with some other group, the engineer feeling that the public image of him is not sufficiently clear as to identify him as a professional man.

WHILE NSPE and its state societies and chapters have through Engineers' Week and other extensive public relations programs continuously worked toward a better public understanding of the engineering profession, the image an individual has is often a reflection of the impression he has of those in the profession. The public image of engineering requires a concern on the part of each individual engineer for this important element of professional development.

EVEN the experts in the field of public relations cannot put their finger on what creates the public image in the community, but suffice it to say that it is a composite of many things. Undoubtedly all engineers could contribute to a better concept of the profession and an understanding on the part of the general public of the important role played by engineering if they would spend a portion of their time in public affairs, and particularly concern themselves with improving their ability to explain in lay language what an engineer does.

IT is most encouraging to note, though, that engineers are becoming more vocal in such activities as politics, civic affairs, and professional groups. Despite a recent study by the Professional Engineers Conference Board for Industry showing a disturbing number of engineers not being active in community life, some recent developments indicate this is changing.

IT might make an interesting chapter meeting to allot to each individual two or three minutes to tell about his engineering experience and, more explicitly, the work he is now doing. The individual should talk about his own particular job rather than the work of the company or organization for which he works. Two benefits would derive from such a chapter discussion: One, a much better understanding on the part of all attending as to the diversity and the extent to which engineering is contributing to the life of that community and, secondly, to emphasize to each individual that it is possible in a short period of time, and in lay language, to tell others of the contribution of engineering in terms of one's own personal experience.

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to think with deep gratitude of those who have lighted the flames within us."

We in management can find no greater satisfaction or pleasure as individuals than in supplying that spark for some young engineer to rise to new and greater heights in our profession.—**End.**

About the Author . . .

Mr. Jacobs

James W. Jacobs is presently manager of Research and Future Products Engineering Department at Frigidaire Division of General Motors Co. He received his B.S. in mechanical engineering from the University of Dayton in 1954 and is a registered professional engineer in Ohio. He holds 70 patents in the fields of appliances, air conditioning and refrigeration. He has been with Frigidaire since 1946.

DOMINY

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tions in their fields. The collective efforts of this staff have contributed to the successful prosecution of such nationally important projects as the Boulder Canyon Project, the Columbia Basin Project, the Central Valley Project, the Upper Colorado River Storage Project, the Missouri River Basin Project, and many others.

To engineers, these projects are better known by their structures, such as Hoover, Grand Coulee, Shasta and Glen Canyon Dams, the Missouri River power generating and transmission systems, and an endless variety of irrigation works in all parts of the West. Two of them, Hoover Dam and the entire Columbia Basin Project, were honored by selection among the seven modern engineering wonders of the United States.

The continuity of experience of our engineering staff acquired through the design, construction and operation of projects such as

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these over the past 50 years is invaluable. It has made available to each succeeding project significant economies and improvements in design and performance. No one private firm could possess, nor could it expect to make available on a continuous basis, such depth and variety of experience as we are called upon to provide.

Because of the continuity and extent of our experience in the field of water conservation and reclamation, the Bureau of Reclamation is called upon from time to time to perform other work to meet special requirements. A specific example of this is a study requested by the Appropriations Committee of the House of Representatives on the potentialities and advantages of pump storage projects.

A more comprehensive assignment was the information furnished to meet the request of the Senate Select Committee on Natural Water Resources. The Federal agencies were primarily called upon to furnish background material upon which this series of Committee releases was based.

To those of you who are in private practice, I recommend that you study the reports issued by the Committee as a basis for potential private engineering work in future years. Remember that every Federal construction job provides employment for professional engineers, both outside and inside the Government.

I might add that funds are not appropriated for such requests as just mentioned which relate to nonspecific projects. Therefore, the Bureau must charge the time of its professional staff in fulfilling such assignments to existing appropriations. Thus the cost of time spent to meet such specialized requests is reflected in our engineering overhead costs. The matter of costs of engineering services in Federal agencies is one of concern both to the administrative officers and engineers in Government as well as in private practice.

It is not difficult to obtain information on the cost of public engineering organizations. The difficulty lies in terminology of cost keeping methods and the scope of

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work which is included, because of the broad nature of the terms "engineering" and "design." Contracts for engineering services with Government agencies can never encompass the entire scope of engineering activity of Federal agencies, the cost of which the agency must charge to the project. If a study of Government engineering costs were undertaken, there is no assurance that the results obtained would be conclusive or show costs directly comparable with those furnished through surveys and reports of engineering societies.

Do not read into my words any lack of concern over engineering costs in the Bureau of Reclamation. Irrespective of criticism of engineering societies, or that of Congressional Committees, we are extremely cost-minded and insist upon getting the greatest production from our engineers and other employees at the lowest cost.

With respect to the employment of private engineering firms and consultants on Reclamation work, I believe that the Bureau's practice is consistent with NSPE. We have on many occasions utilized private consultant engineer services on our construction work where this has been in the best interest of the public. We plan to continue this practice wherever such engineering services can be used effectively to augment or supplement the work of our engineering staff.

For instance, in the investigation and review of the sites and designs for major structures, our policy is to appoint boards of prominent independent consultants to assist in reaching final conclusions on the complex engineering problems involved. In other cases involving structures or work which are beyond the capacity of our staff or involve some unique or specialized field of engineering we call on qualified engineering firms or consultants to perform the work.

There are matters regarding the employment of private engineering services which should be of interest to NSPE.

We have actively supported the

recommendations of the National Society in seeking higher rates of per diem for highly qualified consulting engineers whose services are required in carrying out many difficult and highly technical construction projects.

May I repeat for emphasis, two things: first, that it is my considered opinion that the Bureau of Reclamation must retain a large professional staff regardless of any work which may be farmed out. Secondly, that practically all of our planning and construction work automatically creates a need for additional engineering services outside the Federal establishment.—**End.**

LETTERS

(Continued from page 6)

as keen a competitive battle as any industry, must evaluate, most carefully, the attributes of intended recruits. A person who is unwilling to knuckle down and learn to apply the meager knowledge he has brought from college, before more interesting and challenging projects are assigned to him, has no place in an engineering firm. Similarly, the graduate who has the misconceived notion of the glamor and status which he feels an engineering diploma affords him, has no place in the profession. A graduate doctor faces two years of poorly paid, rigorous internship. A lawyer faces several years of similar status as a law clerk. We recognize with envy the stature of these professions yet the average graduating engineer abhors the thought of similar "internship" as a draftsman, surveyor, computor or technician.

The basic root of this problem is that the medical and law schools turn out professional men; the engineering schools, technicians. The graduate engineer is not an engineer, for he has not the background, knowledge or experience to make sound engineering judgments. The solving of many engineering problems is unique since there is no precedent, as in law or medicine, upon which to make a decision. The graduate must therefore realize, and his undergraduate training must drive the fact home, that he must serve his internship and learn to use the facts to which he was exposed in college. He must be imbued with a sense of professionalism in college to a much greater extent than any college is doing today.

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(Continued from page 53)

The entry of unionization will tend to move the young engineer farther away from professional goals and reliance on his own initiative, and closer to conformance with whatever norm the union achieves through collective bargaining. The engineer is essentially just a brain endowed with reasoning powers, able to solve problems through prior knowledge and experience and creative thinking. How can a union bargain collectively for brains when each one is unique and cannot conform to the norm of union or management rules, seniority and wages? So called improvement of wage scales, job conditions and employee-employer communication mean nothing when what one is employing is latent creative ability. The substitution of union bargaining for initiative would ruin the development of this creative talent and in time reduce engineers to the stature of the conformist mass. . . .

Although the Society is criticized at times for being a management club, it is to our credit that virtually all engineering employers are represented in the membership. It is also to our credit that *all* engineers, whether employer or employee may belong and have an equal voice in the Society's business. This is something the unions are unable to offer. Inclusion of all engineers in one organization allows unbiased study, evaluation and solution of their problems in an amicable atmosphere. Recent collective bargaining in large and small industries have shown the unions to be incapable of fostering mutual concern and understanding between employees and employers. . . .

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SEATO

(Continued from page 22)

to help in solving this problem, analyzing the results or the research, and applying the results to the particular problem at hand. The research program will also be planned to aid in solving problems which confront Southeast Asian countries.

In selecting a thesis problem a student is encouraged to do research along lines where a particular problem exists in his native country. This is one more way in which it is hoped the school will benefit the countries it serves, but it also adds a problem for the student. Not only must his thesis be

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thorough, factual and original, but it must also be pertinent to his homeland.

The school officials saw during the first year the need for a definite and continuous budget in order to depend on any kind of planning. At the beginning donations came in from time to time, but such an indefinite money supply is not the best type of support for the continuing operation of a school.

The problem mentioned in which students had trouble being released from home countries was not the solitary cause of the predominantly Thai student body at the outset. Transportation and finances proved difficult for many students from other countries, in addition to the fact that there are no facilities for training engineers at all in the countries of Cambodia, Laos, South Vietnam, Borneo and Sarawak. Consequently few from these countries would be qualified to enter a graduate study program.

Some special problems arise in obtaining students from all Southeast Asian countries. For example, in Indonesia, anything with a "SEATO" label is regarded with a skeptical view, and it may be several years before that country takes advantages of the engineering school.

One of the major problems encountered by the school was in obtaining a qualified faculty with which to begin and continue. The first staff consisted of four United States' professors, one from New Zealand and three from Thailand. Transporting the American families half-way round the world and maintaining salaries acceptable to them was a large expense. For this reason it is hoped that in the future the majority of the staff will come from Southeast Asian countries.

Finding American professors who were willing to go to Bangkok for two-year terms was not an easy

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task. Signing a two-year contract is almost a necessity when the cost of transportation to the school and the necessity to continue a student advisory program through his entire tour of study are considered. As Frank Tessitor of ICA has said, "To teach in a school which is just being started in a place as far from the homeland as Bangkok takes a professor with a pioneering mind, one who does not want to be tied by years of tradition and enjoys setting his own precedents."

In addition, professors from western countries are accustomed to much higher salaries than those received in the east, a situation which resulted in an unequal pay scale among faculty members at the school. Such an unequal pay scale cannot be maintained for a very long period without creating some ill feelings. The administrative council hopes to remedy this situation within the next year or so.

Long term professors are needed for several reasons. It is difficult to make plans either with individual students or with the school as a whole, when professors come for such short terms as five to six months and do not know until the termination of that period whether they will be able to continue, as has been the case with several who came from outside the United States. Likewise, a reliable estimate of the size of the student body is also impossible. Since there are apt to be many late entries, it is difficult to know far enough in advance to hire a larger faculty whether or not additional staff members will be needed. During the first year two of the Thai professors were also obligated to teach at Chulalongkorn U. so could only devote a limited amount of time to the SEATO school. At present the student-faculty ratio is 6:1. They hope for a 5:1 ratio which could be continued as this is a more effective working ratio for a graduate school.

The present faculty consists of three from Thailand, six from the United States, one from New Zealand and one from the United Kingdom, with the possibility of a French professor of highway engineering and a Filipino professor for irrigation engineering. The United States also has three men on the administrative staff.

Expansion of the school will be toward offering more and varied courses rather than degrees beyond a master's. R. T. Shen, engineering assistant on the planning staff, explained, "At the present time, we have no plans to offer a degree higher than master's. We feel that a doctoral program should be supported by strong graduate programs in other related fields. A plan to expand the mathematics, physics, and other departments of the University of Chulalongkorn by our efforts alone would be over-ambitious at this time. The needs of Southeast Asia virtually dictate that any augmentation should be directed toward broadening into more fields such as coastal engineering, industrial engineering, photogrammetry, etc., rather than intensification in the existing fields."—End.

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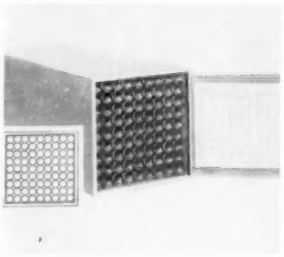

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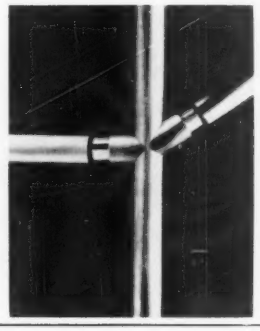

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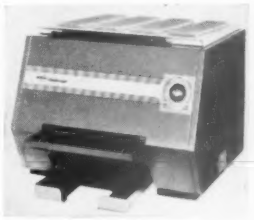

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